"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Compressed hydrocarbon gases as solvents of oil and oil residues. Part II.

ethylene at 105°C. The ability of these gases to dissolve petroleum products increases in the following sequence: ethylene, propane, propylene, mixture of propane with propylene; only products with a higher quantity of paraffin-naphthene hydrocarbons are dissolved more easily by propane than by propylene.
There are 3 figures, 5 tables and 1 Slavic reference.

SUBMITTED: May 3, 1957.

AVAILABLE: Library of Congress.

Card 2/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, T.P.; SHEREMETA, B.K.

Adsorption method for the purification of raw ozocerites using compressed gases for the extraction. Trudy Inst.nefti 13 '59.
(MIRA 13:12)

(Ozocerite) (Gases, Compressed)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, T.P., YUSHKEVICH, G.N.

Solubility of petroleum and its heavy fractions in compressed gases. Trudy Inst.nefti 13:262-274 '59. (MIRA 13:12)
(Petroleum products) (Gases, Compressed)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZOZE, T.P.; YUSHKEVICH, G.N.; SAFRONOVA, T.P.

Method of the extraction of raw ozocerite from ozocerite ores by means of compressed gases. Trudy Inst.nefti 13:275-279 '59.
(MIRA 13:12)

(Ozocerite) (Gases, Compressed)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Zhuze, T. P.

AUTHORS: Safronova, T.P. and Zhuze, T.P. 65-2-7/12

TITLE: An Investigation of the Solubility of Gases in Crude Petroleum Oils at Increased Pressures and Temperatures. (Izucheniye rastvorimosti gazov v neftyakh pri povyshennykh davleniyakh i temperaturakh).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr.2. pp. 41 - 46. (USSR).

ABSTRACT: The solubility of gases in petroleum is influenced by the pressure, temperature and properties of the gas, and the nature of crude petroleum oils. The solubility of gases (methane, propane, ethylene, CO_2 and nitrogen) in Romashkinsk and Tuymazinsk etc. crudes at pressures 300 - 350 atms. and temperatures of 20, 50, and 100°C, was investigated and the apparatus for this is shown in Fig.1. Methane and propane were selected as they are the components of natural gas, and also to define the inter-relationship between the solubility of a gas and its molecular weight. Nitrogen and CO_2 are also components in natural gas; ethylene is not contained in natural gas, but was tested to clarify the solubility of unsaturated hydrocarbons. Pure ethylene, which contained no impurities, was used. Table 1 gives the properties of the different types of crudes which

Card 1/3

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

An Investigation of the Solubility of Gases in Crude Petroleum Oils at Increased Pressures and Temperatures.

were tested. Figs. 2 - 5 show results obtained, in the form of graphs. The quantity of nitrogen dissolved in the crude petroleum oils increases when the pressure is increased, and at the same time the coefficient of solubility of nitrogen decreases. An increase in the temperature gives higher solubility of nitrogen. The solubility of methane in crude petroleum oils is considerably higher than that of nitrogen at the same temperature and under the same pressure conditions. Table 2 gives comparative data for solubility coefficients of nitrogen, methane, and other gases at 100°C. Propane shows better solubility than methane. Curves of the interdependence of the solubility coefficient of propane and the pressure are characteristic and show a sharp maximum at pressure interval of 50 - 75 atms. The solubility of ethylene in petroleum is considerably higher than that of methane, but not as high as that of propane. At pressures between 50 - 100 atms. the solubility of propane increases rapidly with pressure; at 50 atms (20°C) and 100 atms (50 and 100°C)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

65-2-7/12

An Investigation of the Solubility of Gases in Crude Petroleum Oils at Increased Pressures and Temperatures.

the form of isotherms changes. CO_2 is very soluble in crude petroleum oils; it is more soluble than methane, but not so soluble as ethylene and propane. In all cases the solubility coefficients for the various types of crude petroleum oils are given. There are 2 Tables and 5 Figures, 12 References: 8 Russian and 4 English.

ASSOCIATION: Petroleum Institute AS USSR. (Institut nefti AN SSSR).

AVAILABLE: Library of Congress.

Card 3/3

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, T.P.; YUSHKEVICH, G.N.

Evaluating the relationships between the volumes of the gas and liquid phases of condensate/oil pools according to data from laboratory modeling. Geol. nefti i gaza 5 no.7:48-50 Jl '61. (MIRA 14:9)

1. Institut geologii i razrabotki goryuchikh iskopayemykh Ministerstva geologii i okhrany nedr SSSR.
(Oil reservoir engineering)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Zhuze, T.P.

ZHUZE, T.P.; YUSHKEVICH, G.N. (Moskva).

Solubility of petroleum and petroleum residue in compressed hydrocarbon gases. Izv. AN SSSR. Otd. tekh. nauk no.11:63-68 N '57.
(Petroleum research) (Hydrocarbons) (MIRA 11:1)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, T.P.; YUSHKEVICH, O.N. (Moskva).

Compressed hydrocarbon gases used for dissolving petroleum and petroleum residues. Part 2. Izv. AN SSSR. Otd. tekh. nauk no.12: 83-86 D '57. (MIRA 11:1)

(Petroleum--Testing)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

SOV/24-58-11-33/42

AUTHORS: Zhuze, T. P., Safronova, T. P. and Yushkevich, G. N. (Moscow)

TITLE: Extraction of Ozokerite from Ozokerite Ores by Means of Compressed Gases (Ekstraktsiya ozokerita iz ozokeritovykh rud szhatymi gazami)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 11, pp 123-125 (USSR)

ABSTRACT: The here described method, developed at the Oil Institute, Ac.Sc. USSR, is based on the ability of a number of hydrocarbon gases to dissolve satisfactorily hydrocarbons if these gases are compressed to some pressure at a temperature exceeding their critical temperature. It is also known that the dissolving ability of gas increases at a constant temperature with increasing pressure; at higher pressures the gases begin to dissolve not only hydrocarbons but also asphalt-resin compounds. The test-rig on which the extraction experiments were carried out consisted of a column, a separator, a receiver and a compressor. The column consisted of a 1500 mm long, 45 mm inner dia. tube scheduled to withstand 150 atm. The column was fitted with external electric heating and

Card1/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Extraction of Ozokerite from Ozokerite Ores by Means of Compressed Gases

inside it the temperature was measured by means of a 3-point thermocouple and the pressure by means of a pressure gauge. The column was joined by means of a throttling valve with a separator, a 0.5 litre vessel, rated for a pressure of 70 atm and fitted with external electric heating. The separator was joined by means of a valve to the receiver. The operation was as follows: at the bottom of the column a few layers of the substance was placed to serve as a filter and ore was loaded into the column. Following that, the column was heated to 100°C, then gas was passed through it which was preliminarily compressed to the selected extraction pressure. After passing through the ore, the gas dissolved the hydrocarbons contained in the ore and passing through the filter, which retained the ore dust, it flowed through a throttling valve into the separator where the pressure was reduced to 40-50 atm. The temperature in the separator was maintained at the same level as in the column, i.e. at 100°C. Since at these pressures the gas no longer acts as a solving agent, the products dissolved in it separate out (i.e. ozokerite raw material),

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Extraction of Ozokerite from Ozokerite Ores by Means of Compressed Gases

the regenerated gas is drawn off by the compressor and is additionally compressed to the initial pressure and is then again directed into the column for further ore extraction. Thus, the extraction process was effected with a continuous circulation of the gaseous solvent. On accumulation of the raw ozokerite in the separator it was transferred into the receiver where it was maintained at atmospheric pressure by means of a throttling valve. Thereby, gas separated out from the raw ozokerite which became dissolved in it in the separator in a quantity corresponding to the respective temperature and pressure; this gas was removed into a gas container. The characteristic of the ores which were subjected to such extraction are entered in Table 1. The ore was charged in the column in the as-delivered state without additional breaking up or drying, it consisted of a mixture of pulverised particles with bits of various dimensions between 2 and 10 mm. The extraction of the ozokerite from the ores was effected by means of propane-propylene fractions, the composition of which is entered in Table 2, which also contains information on the conditions of the

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

SOV/24-58-11-33/42

Extraction of Ozokerite from Ozokerite Ores by Means of Compressed Gases

experiments and the obtained results. The raw ozokerite extracted by means of compressed gases is characterised by a light brown colour and contains considerably less resin than those extracted by means of gasoline. There are 3 tables and 1 Soviet reference.

SUBMITTED: May 28, 1958

Card 4/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

GULYAYEVA, L.A.; ZHUZE, T.P.; YUSHKEVICH, G.N.; KOVALEVA, T.A.

Solubility of the metal-organic compounds of oil and bitumens in compressed gases. Lit. i pol. iskop. no.4:185-188 Jl-Ag '65. (MIRA 18:9)

1. Institut geologii i razrabotki goryuchikh iskopayemykh, Moskva.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

S/181/60/002/011/026/042
B006/B056

24,7700 (1035, 1043, 1143)

AUTHORS: Zhuze, V. P., Sergeyeva, V. M., and Shelykh, A. I.

TITLE: Electrical Properties of the In_2Te_3 Defect-type Semiconductor

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 11, pp. 2858-2871

TEXT: The authors give a report on the results obtained by investigations of the electrical properties (conductivity, thermo-emf, Hall effect) of the In_2Te_3 semiconductor which has a high concentration of lattice vacancies ("intrinsic" defects - cationic vacancies) and cause a disturbance of the periodicity and a distortion of the potential field of the crystal. They greatly affect the motion and scattering of carriers and phonons. The authors chose In_2Te_3 because this defect-type semiconductor lies in the middle of the isoelectronic series AgI - CdTe - InSb - α-Sn, whose electrical and thermal properties are known, and also because the structure of this compound has already been investigated and some indications as to the arrangement of cationic vacancies are available; thirdly, data on electrical

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Electrical Properties of the In_2Te_3 Defect-type Semiconductor

S/181/60/002/011/026/042
B006/B056

and photoconductivity as well as optical absorption are available, while there are no data on galvanomagnetic, thermoelectrical and thermal properties. In_2Te_3 was synthesized from the elementary components in quartz ampoules by fusion at 700-750°C. As shown by A. I. Zaslavskiy and V. M. Sergeyeva, this compound exists in the α- and β-phases, the latter being stable above 550°C. Some properties of these two forms are given in Table 1. Fig. 1 shows the temperature dependence of the electrical conductivity of stoichiometric α-In_2Te_3. In the range of -70 - +400°C there is intrinsic conductivity; the inclination of the straight line $\log\sigma = f(1/T)$ does not change up to melting temperature (667°C). Fig. 2 shows the irreversible change in electrical conductivity by heating up to more than 400-500°C in air (1) or by continuous evacuation (2). Fig. 3 shows the change in electrical conductivity in the $\beta \rightarrow \alpha$ transition. The Hall effect was measured with direct current and in a constant magnetic field, using a compensation method. Fig. 4 shows the Hall coefficient R within the range of intrinsic conductivity as a function of temperature; the diagram also contains the mobility as a function of temperature. Fig. 5 shows analogous diagrams for other specimens with different degrees of orientation. Also Fig. 6

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Electrical Properties of the In_2Te_3 Defect-type Semiconductor

S/181/60/002/011/026/042
B006/B056

shows σ and R as temperature functions of stoichiometric In_2Se_3 within the range of intrinsic conductivity, the degree of orientation rising in the sequence 3, 2, 1. Also the thermo-emf, $\alpha = f(1/T)$, is a straight line (Fig. 7). The numerical values obtained for the parameters of high-purity In_2Se_3 are given in Table 2. The forbidden band width at $0^\circ K$ was determined to be 1.12 ± 0.05 ev. Further, the impurity conductivity was investigated. It could be shown that Bi impurities induce n-type, and iodine p-type, conductivity, whereas other atoms (Mg, Cd, Cu, Hg, Sb, Sn, Zn, Si, and Ge) in quantities of 1 at% cause no impurity conductivity. Fig. 8 shows $\log\sigma = f(1/T)$ for In_2Se_3 with 1 at% Sb, Cu, Hg, and Sn (parallel straight lines). Fig. 9 shows the temperature dependence of σ, R, and u_n on n-type In_2Se_3, and Fig. 10 shows the same for p-type In_2Se_3. Furthermore, details of chemical binding are discussed (Scheme, Fig. 11). The refractive index, n, (measured by M. I. Kornfel'd) was found to be 3.4 ± 0.3 for $\lambda = 2.2$ μ, and the dielectric constant, ε, was equal to 16. The results of these investigations are discussed in detail, especially with respect to mobility. On account of the carrier scattering cationic vacancies, the mobility

Card 3/7

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

86439

Electrical Properties of the In_2Te_3 Defect-type Semiconductor

S/181/60/002/011/026/042
B006/B056

(like in other semiconductors of the group $A_2^{III}B_3^{IV}$; see table) is much smaller than in neighboring isoelectronic binary compounds of perfect structure. The carrier mobility is constant within a wide temperature range, which is explained by the predominance of scattering by electrically neutral cationic vacancies. V. A. Petrusevich, I. Z. Fisher, V. N. Bogomolov, and A. F. Ioffe are mentioned. Ye. L. Shtrum' is thanked for chemical discussions, and N. F. Shvartsenau for help in measurements. There are 11 figures, 3 tables, and 27 references: 9 Soviet, 9 German, 4 US, 1 Dutch, and 3 Japanese.

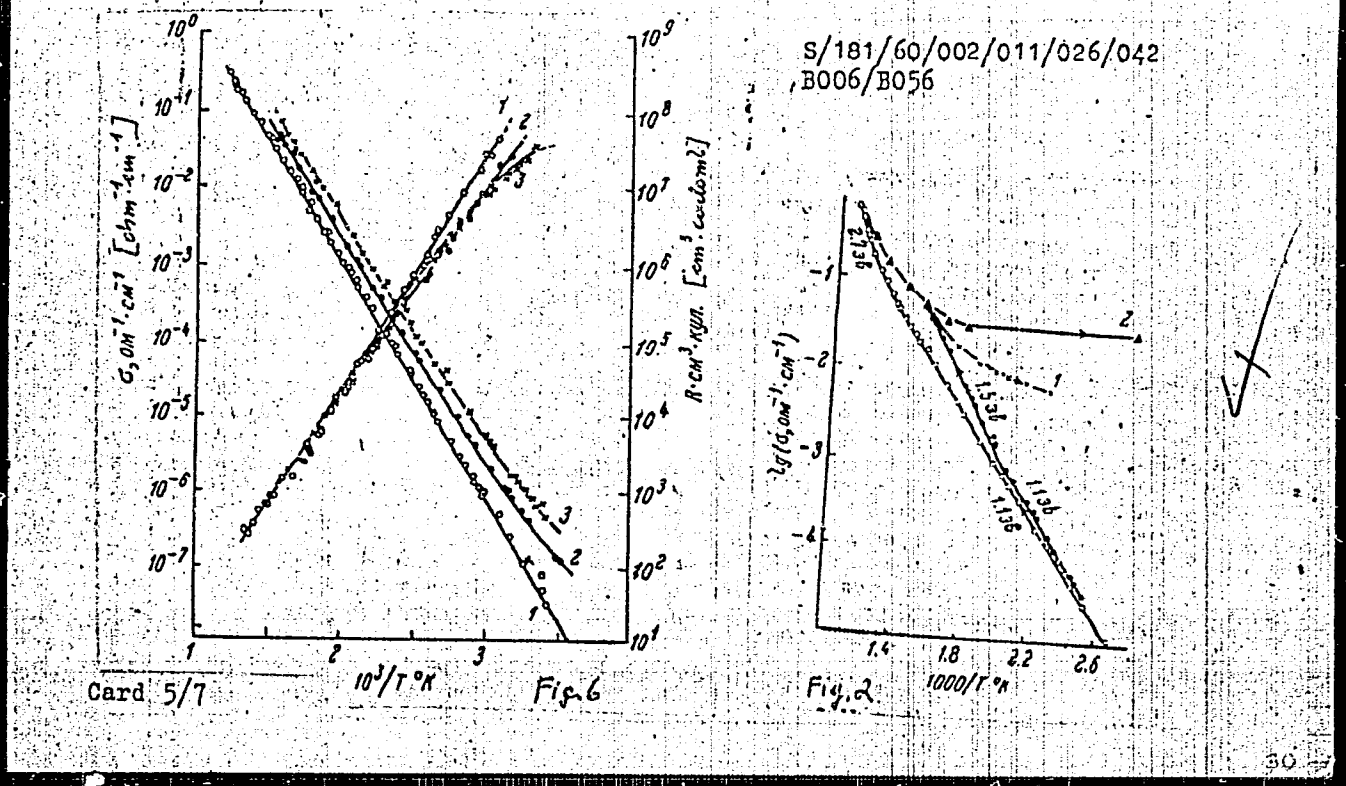
ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad
(Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: July 15, 1960

Card 4/7

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

86439

S/181/60/002/011/026/042
B006/B056

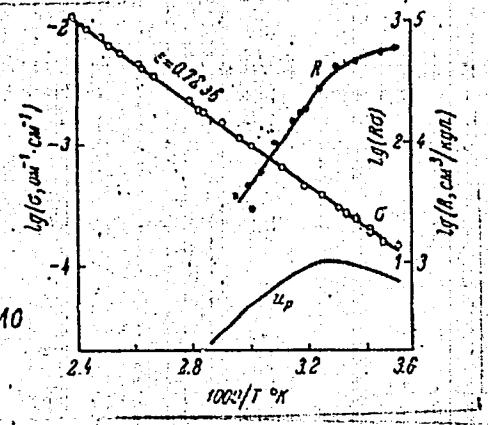


Fig. 10

Таблица 2.

T, °K	R, см³ · кул.⁻¹	n_i, см⁻³	$\frac{2}{m_0}\frac{}{m_n m_p}$	$\frac{m_n}{m_0}$	$\frac{m_p}{m_0}$
334	$1.6 \cdot 10^{1}$	$7.68 \cdot 10^{11}$	1.20	0.70	1.23
417	$2.8 \cdot 10^{1}$	$4.1 \cdot 10^{13}$	1.15	0.71	1.27
556	$7.9 \cdot 10^{0}$	$1.6 \cdot 10^{15}$	1.27	0.67	1.20

Card 6/7

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

86439

S/181/60/002/011/026/042
B006/BC56

Таблица 3

	$A^{I}B^{VII}$	$A^{II}B^{VI}$	$A_2^{III}B_3^{VI}$	$A^{III}B^{V}$	$A^{IV}A^{IV}$
ΔE_0 вв [eV]	CuBr	ZnSe	Ga_2Se_3	GaAs	Ge
a, Å	≃2.9	2.8	1.85 [24]	1.50	0.78
Ионность, %	5.68	5.65	5.42	5.63	5.65
μ_e, см²/в · сек.	—	18	16	7	0
[cm^2/v.sec]	—	200	10	≃4000	3900
ΔE_0, вв	CuJ	ZnTe	Ga_2Te_3	GaSb	Ge + α-Sn
a, Å	—	2.2	1.15 [24]	0.81	—
Ионность, %	6.05	6.08	5.87	6.09	—
μ_e, см²/в · сек.	—	13	11	5	—
	—	300	50	≃5000	—
ΔE_0, вв	AgJ	CdTe	In_2Te_3	InSb	α-Sn
a, Å	≃2.8	1.80	1.12	0.23	0.08
Ионность, %	6.47	6.46	6.14	6.44	6.46
μ_e, см²/в · сек.	—	16	13	7	0
	50	600	15—70	80000	3600

Card 7/7

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

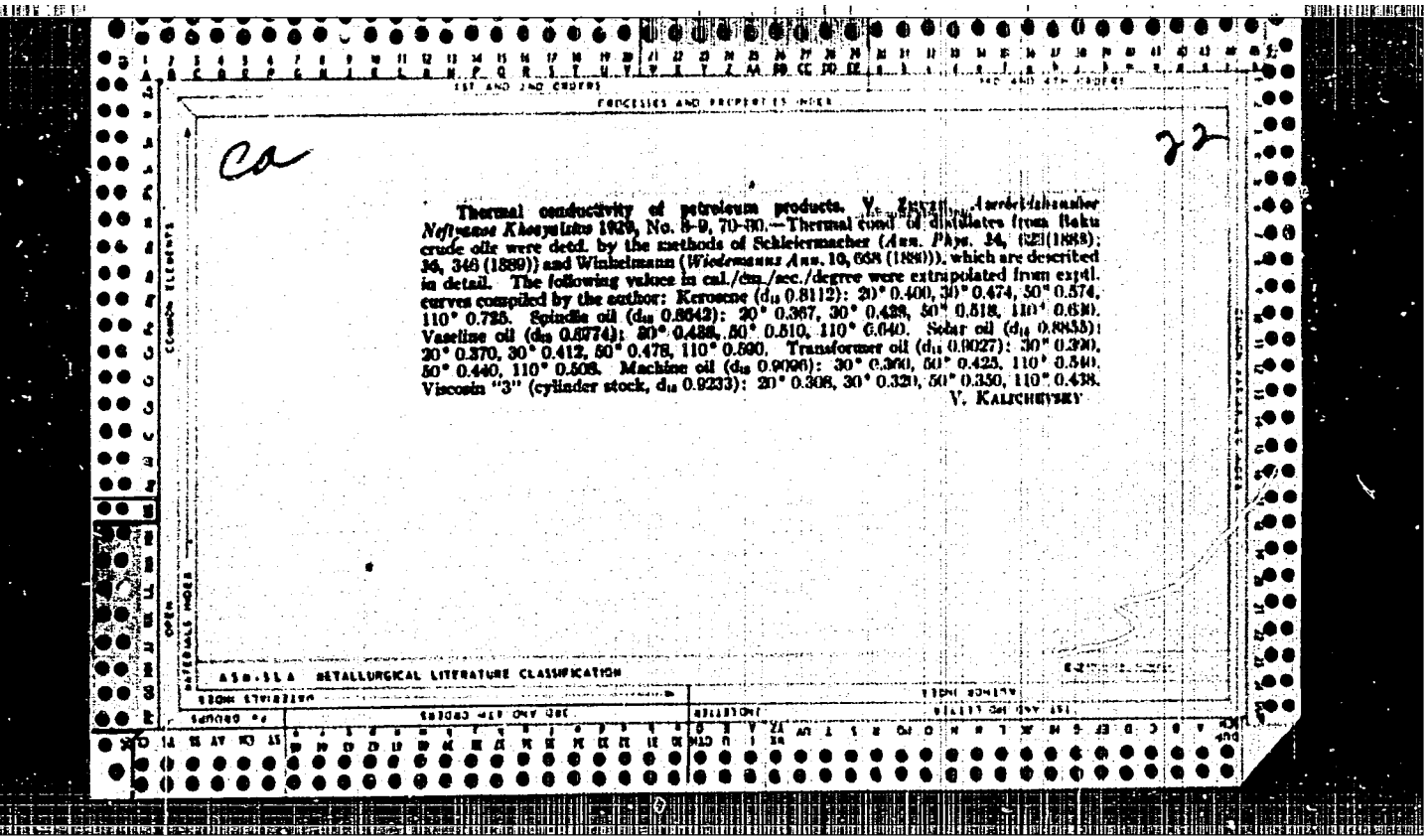
"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P., red.; GESSEN, L.V., red.; DEKHATIYEVA, F.Kh., tekhn.red.

[Semiconductors; problems of the chemical bond. Translated articles] Poluprovodnikovye veshchestva; voprosy khimicheskoi sviazi. Sbornik statei. Pod red. V.P.Zhuze. Moskva, Izd-vo inostr.lit-ry, 1960. 292 p. (MIRA 14:3)
(Semiconductors)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



Ca

72

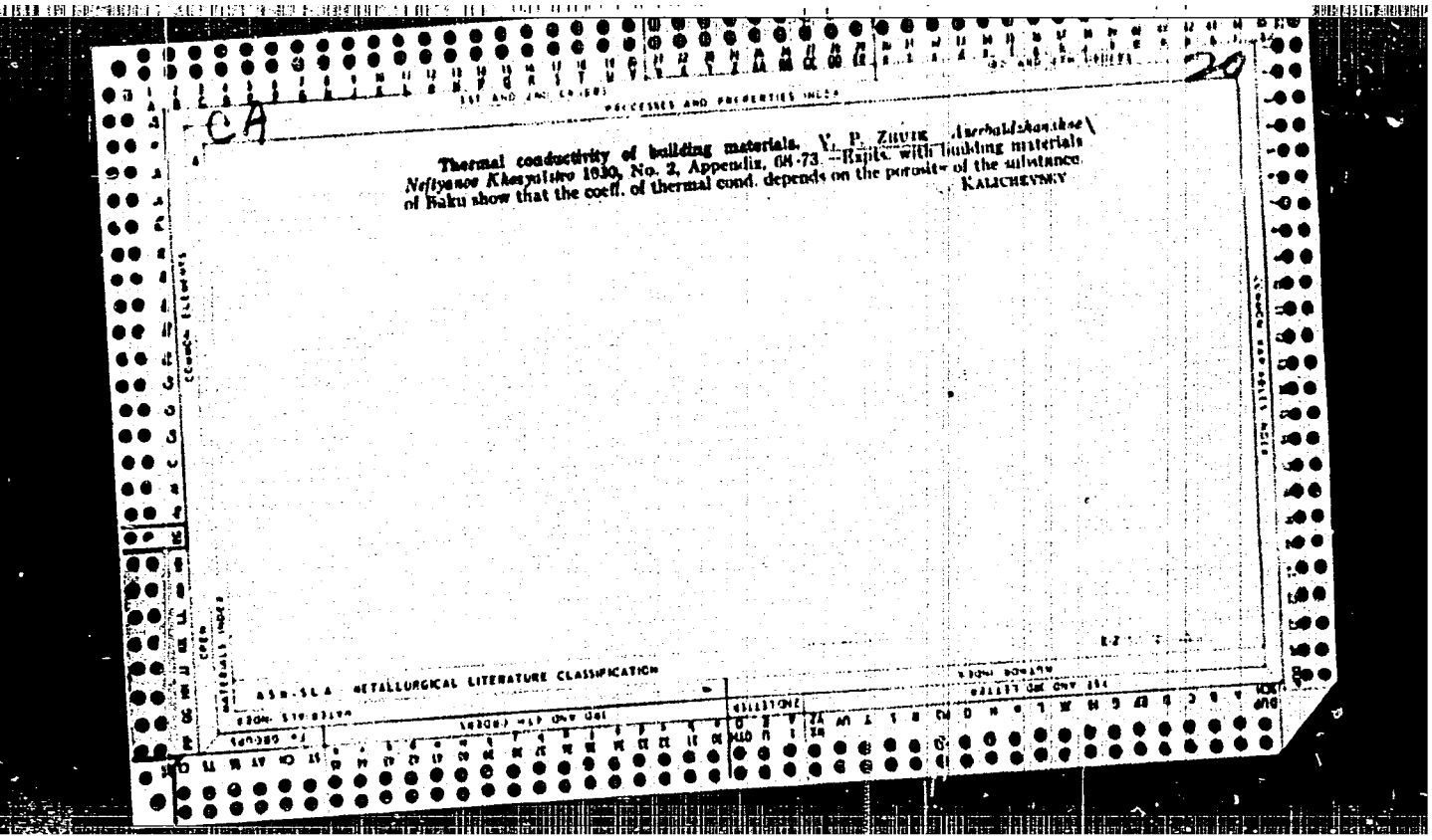
Thermal conductivity of petroleum products. V. [illegible] *Neftyanoe Khozyaistvo* 1929, No. 8-9, 70-80.—Thermal cond. of distillates from Baku crude oils were detd. by the methods of Schleiermacher (*Ann. Phys.* 34, 623(1888); 36, 346 (1889)) and Winkelmann (*Wiedemanns Ann.* 10, 658 (1880)), which are described in detail. The following values in cal./cm./sec./degree were extrapolated from exptl. curves compiled by the author: Kerosene (d_{15} 0.8112): 20° 0.400, 30° 0.474, 50° 0.574, 110° 0.725. Spindle oil (d_{15} 0.8642): 20° 0.367, 30° 0.438, 50° 0.518, 110° 0.630. Vaseline oil (d_{15} 0.8774): 30° 0.438, 50° 0.510, 110° 0.640. Solar oil (d_{15} 0.8835): 20° 0.370, 30° 0.412, 50° 0.478, 110° 0.590. Transformer oil (d_{15} 0.9027): 30° 0.390, 50° 0.440, 110° 0.508. Machine oil (d_{15} 0.9096): 30° 0.360, 50° 0.425, 110° 0.540. Viscosin "3" (cylinder stock, d_{15} 0.9233): 20° 0.308, 30° 0.320, 50° 0.350, 110° 0.438.

V. Kalichevsky

A58-51A METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



CA

Thermal conductivity of building materials. V. P. Zhuze. *Neftyanoe Khozyaistvo* 1930, No. 2, Appendix, 64-73.—Rapid. with building materials of Baku show that the coeff. of thermal cond. depends on the porosity of the substance. KALICHEVSKY

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

CA

22

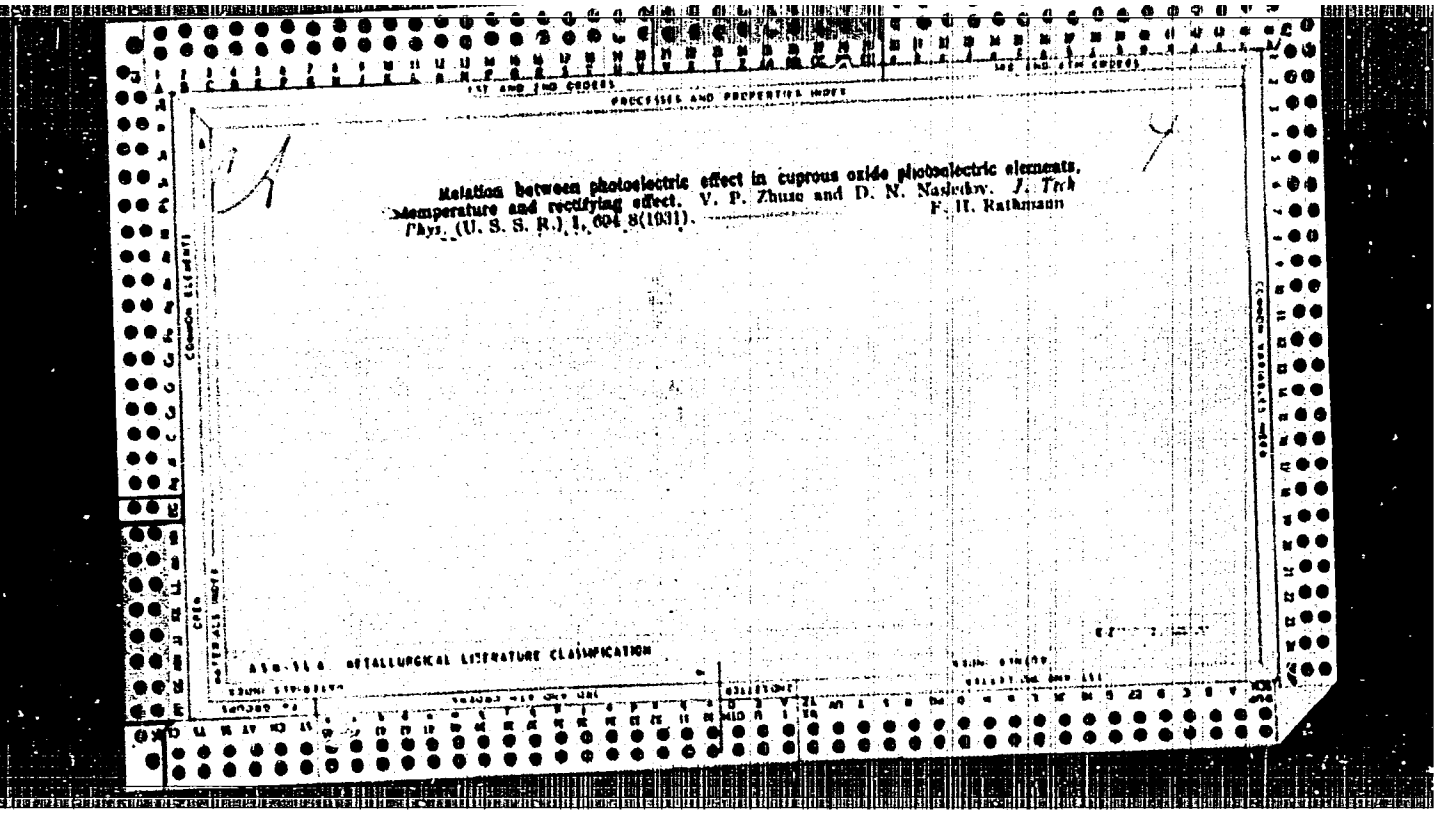
Dielectric constants of petroleum and its products. V. Zhuze. *Azerbaidzhanskoe Neftyanoe Khozyaistvo* 1930, No. 12, 88-98.—The dielec. consts. of petroleum and its products increase with the increase in sp. gr., b. p. and mol. wt. of oils. The same relation holds for paraffins, contrary to the conclusions of Pécheux (C. A. 21, 160). The dielec. const. is very closely equal to $(n_D)^2$. For paraffins, the const. increases with the increase in m. p. The temp. coeff. of the const. is neg. for petroleum products. In abs. value it increases with the d. except for the paraffins, for which it shows a decrease. The temp. coeff. of paraffins is 2-3 times smaller than that of liquid mineral oils. The dielec. const. of naphthenic acids increases with increase in sp. gr., b. p., surface tension, index of refraction and mol. wt.

V. Kalichevsky

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

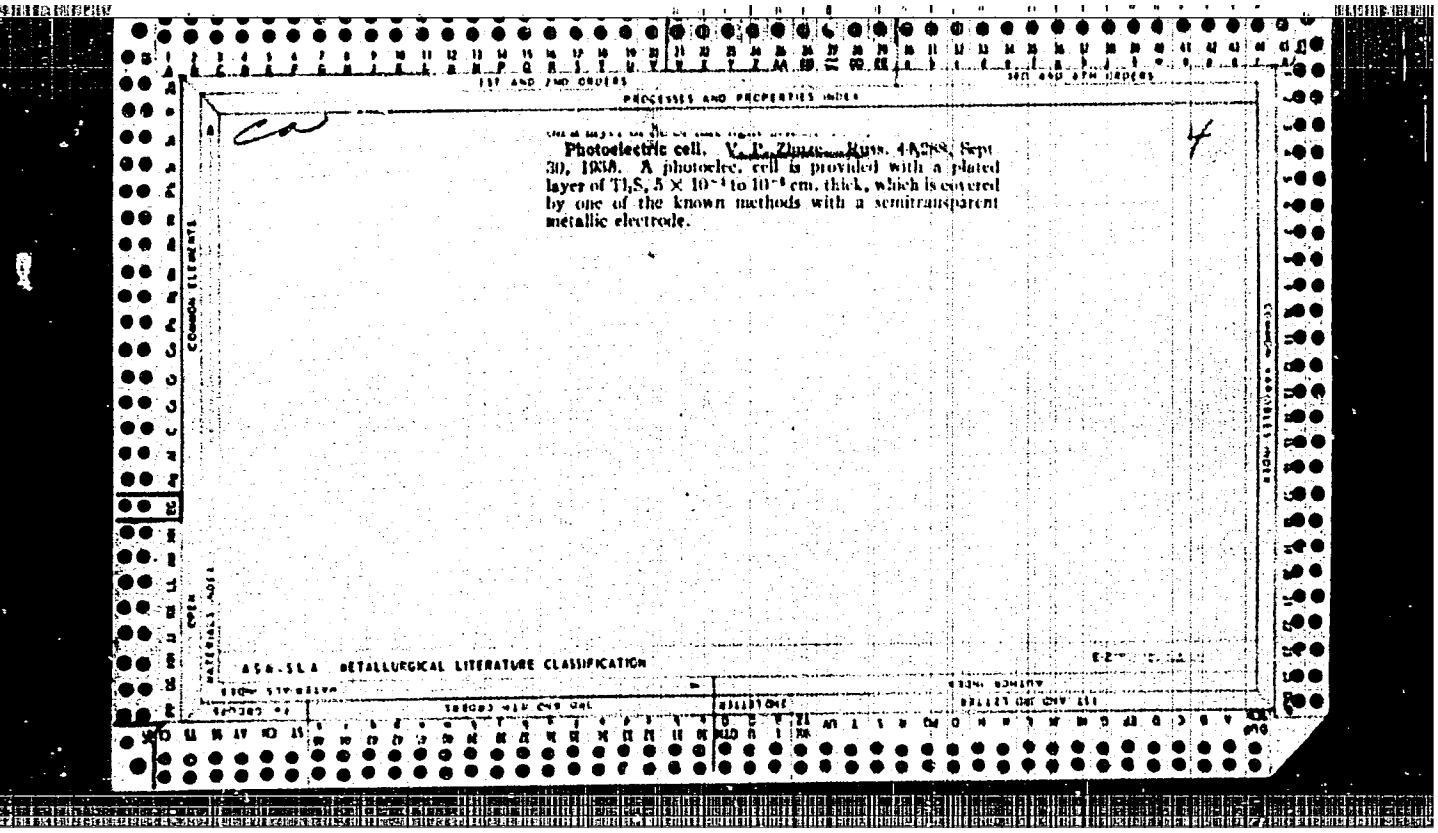
"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



Relation between photoelectric effect in cuprous oxide photoelectric elements, temperature and rectifying effect. V. P. Zhuze and D. N. Nasledov. *J. Tech Phys. (U. S. S. R.)* 1, 604-8(1931). F. H. Rathmann

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



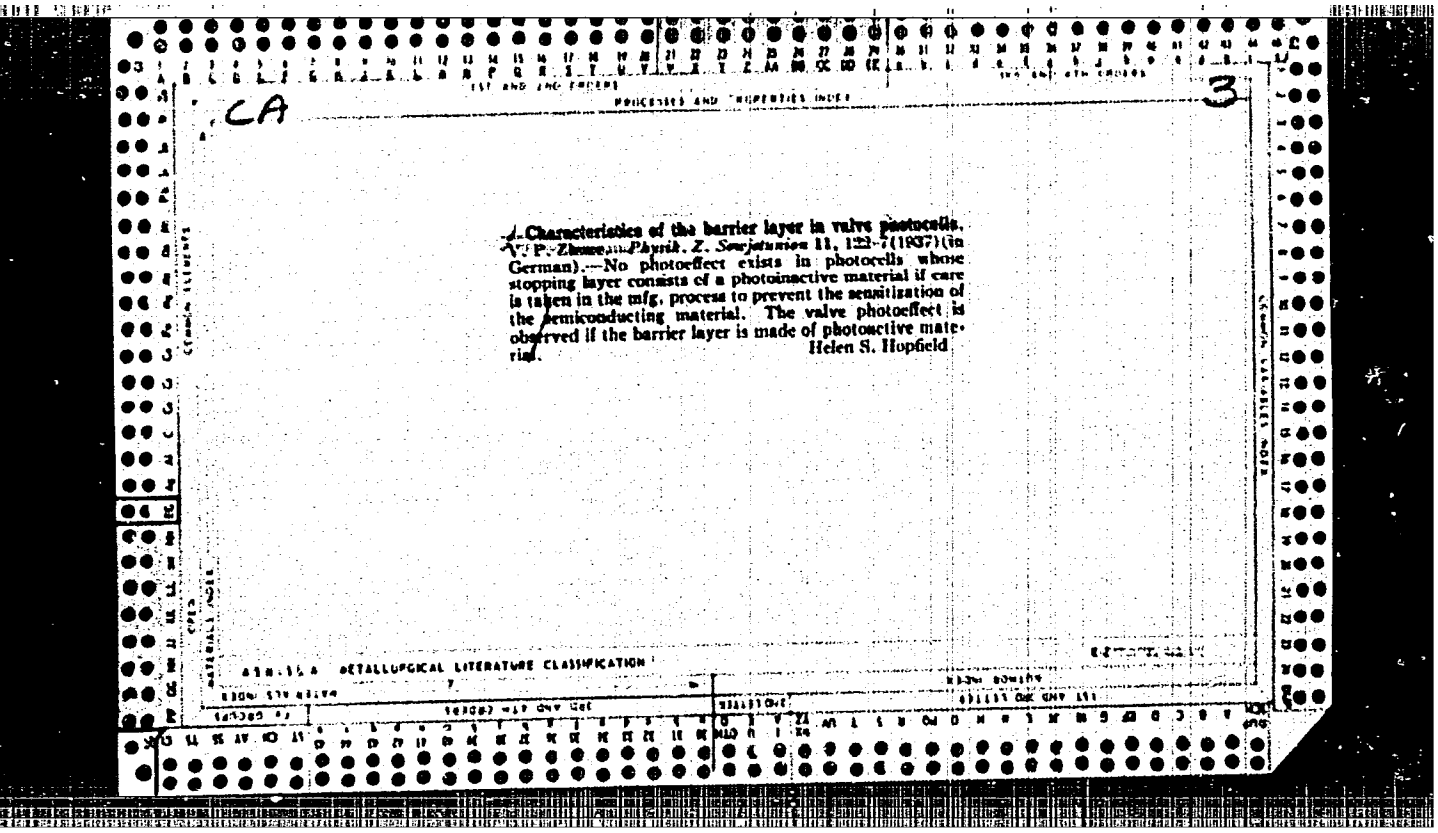
PROCESSES AND PROPERTIES INDEX

Photoelectric cell. V. P. Zhuze. Russ. 44,288, Sept 30, 1958. A photoelec. cell is provided with a plated layer of Tl_2S, 5×10^{-4} to 10^{-3} cm. thick, which is covered by one of the known methods with a semitransparent metallic electrode.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



CA

3

Characteristics of the barrier layer in valve photocells. W. P. Zhuze and *Physik. Z. Sowjetunion* 11, 122–7 (1937) (in German).—No photoeffect exists in photocells whose stopping layer consists of a photoinactive material if care is taken in the mfg. process to prevent the sensitization of the semiconducting material. The valve photoeffect is observed if the barrier layer is made of photoactive material.

Helen S. Hopfield

A1N.11A METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

PROCESSES AND PROPERTIES INDEX

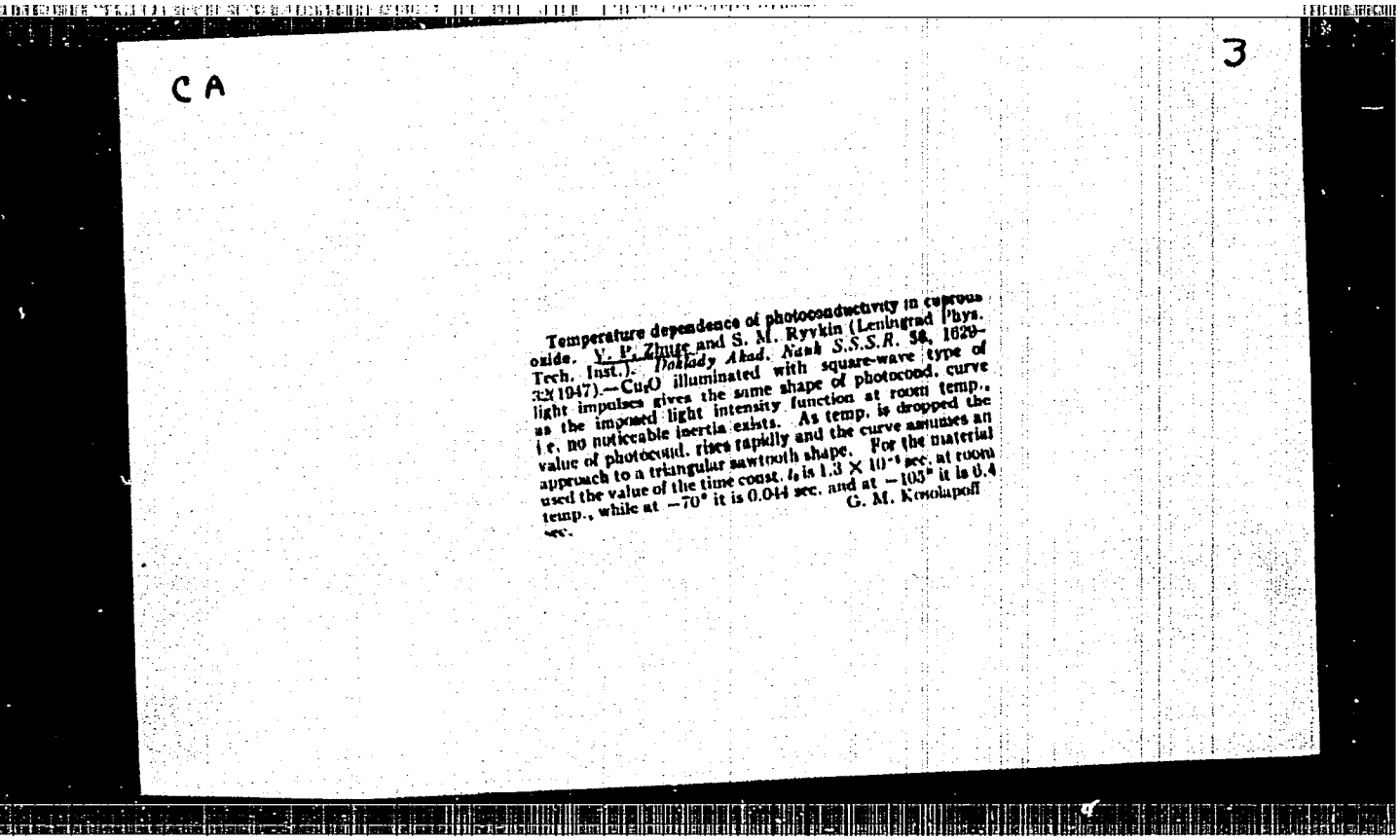
Electric conductivity and thermoelectric properties of Cu_4O_3. V. P. Zhuze and I. N. Starchenko. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 331–40(1940).—The authors studied the elec. cond. of Cu_4O_3 in the temp. interval 30–80° and found an anomalous change in the rate of temp. dependence of cond. at about 45°. Thermo-electromotive power of the Cu-Cu_4O_3-Cu couple was studied in the temp. interval 10–80° with the result that near 45° it reaches its max. value. X-ray diagrams of Cu_4O_3 coincide, within the possible errors, with those of Cu_2O.

R. Gamow

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



CA

3

Temperature dependence of photoconductivity in cuprous oxide. V. P. Zhuze and S. M. Ryvkin (Leningrad Phys. Tech. Inst.). *Doklady Akad. Nauk S.S.S.R.* 58, 1629–32(1947).—Cu_2O illuminated with square-wave type of light impulses gives the same shape of photocond. curve as the imposed light intensity function at room temp., i.e., no noticeable inertia exists. As temp. is dropped the value of photocond. rises rapidly and the curve assumes an approach to a triangular sawtooth shape. For the material used the value of the time const. t_0 is 1.3×10^{-4} sec. at room temp., while at −70° it is 0.044 sec. and at −103° it is 0.4 sec.

G. M. Kovalapoff

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Physical properties of intermetallic compounds (Mechanism of the electric conductivity of Mg_3Sb_2). B. I. Boltaks and V. P. Zhuze (Leningrad Phys.-Tech. Inst.). *Zhur. Tekh. Fiz.* 18, 1459-77(1948); cf. following abstr.—Mg_3Sb_2 was investigated as a representative of the class of intermetallic compds. with normal valency of the elements and well-defined single compn., permitting deviations from stoichiometry only within a relatively narrow range. The alloys were prepd. by fusion of the elements under N_2 or A, with slow rise of the temp. to 1400-500° during 8-10 hrs., slow cooling during 6-8 hrs., and 10-12 hrs. annealing at 500-600°; the samples obtained were coarsely polycryst. (attempts to grow single crystals in conical tubes were unsuccessful). A series of samples cut out from ingots differed by an excess of either Sb or Mg over the stoichiometric compn. (Sb 77, Mg 23%): (I) Sb 78.7, Mg 21.3% (Sb excess, 7.5%), (II) 72.0, 28.0 (Mg, 5.3), (III) 73.8, 26.2 (Mg, 4.0), (IV) 74.5, 25.5 (Mg, 3.1), (V) 76.2, 23.8 (Mg, 0.9), (VI, 76.8, 23.2 (Mg, 0.2) (annealed 24 hrs. at 600°), (VII) 77.4, 22.6 (Sb, 1.0), (VIII) 75.35, 24.65 (Mg, 1.77). The elec. cond. σ increases very strongly with the deviation from stoichiometric compn.; at 20°, for the above samples, σ = 51.2, 6.4, 0.41, 0.025, 0.00081, 0.032, 7.85, 0.56 ohm^{-1} cm^{-1}. More-prolonged annealing increases σ roughly by a factor of 10, but leaves the temp. coeff. $d\sigma/dT$ unchanged; subsequently repeated heating and cooling does not change σ any further. The temp. dependence of σ (measured between −160 and +350°, occasionally to +600°) of different samples varies within wide limits, with respect to both magnitude and sign. Poorly conducting samples have a low pos. temp. coeff. of σ at low temps., but at higher temps. σ increases exponentially with the temp., as in typical semiconductors; in that high-temp. range, log σ is a linear function of $1/T$. The width ΔE of the forbidden zone, from the slope of the high-temp. log σ, $(1/T)$ plots, is V 0.47, VI 0.43 e.v.; ΔE varies from 0.36 to 0.72 e.v. At low temps., the 1st (impurity) term in $\sigma = A_1 e^{-\Delta E_0/2kT} + A_2 e^{-\Delta E/2kT}$ (with $A_1 = 2 \times 10^{-4} - 4 \times 10^{-3}$, $\Delta E_0 = 0.05 - 0.10$ e.v.) is significant over the 2nd (intrinsic) term. By electrolysis expts. at 20 and at 350°, the contribution of ionic cond. is certainly less than 0.1%. The Hall const. R is pos. throughout, and decreases with increasing temp. in all samples; the slope of the log R, $(1/T)$ plot is small at low temps., and larger at higher temps. With further rising temp., R tends to zero, for about 800-1000°; in that range, the alloy becomes an intrinsic semiconductor. In the low-temp. range, ΔE_0 from the Hall effect varies between 0.01 and 0.05 e.v., and in the high-temp. range ΔE varies between 0.52 and 0.69 e.v., i.e. in good agreement with the values derived from σ. The pos. sign of R corresponds to hole cond. On the uncertain assumption of only one kind of carrier, the mean free path at 20° is estd. to be $(1.2 - 3.0) \times 10^{-6}$ cm. Carrier mobilities estd. on the same basis are very widely scattered, ranging from 0.01 to 50 cm./v./cm.; this scattering is taken to indicate mixed carriers. By detns. of the thermoelec. e.m.f. (against Cu), most samples were found to be hole conductors, and only a few electronic conductors. Low-cond. samples (of σ = 0.00002 − 0.0008 ohm^{-1} cm.$^{-1}$) showed a thermoelec. e.m.f. α decreasing with increasing temp. in conformity with the theoretical formula for semiconductors with only one kind of charge carrier; the value of ΔE from the temp. dependence of α is in agreement with the order of magnitude derived from σ and from R. The theoretical formula is in good agreement with the measurements at higher temps.; at lower temps., the exptl. α are

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P. PA 19/49T33

USSR/Chemistry - Chemical Compounds, Dec 48
Intermetallic
Chemistry - Conductivity, Electric

"Photoconductivity of Some Intermetallic Compounds," V. P. Zhuze, I. V. Mochan, S. M. Ryvkin, Leningrad Physicotech Inst, Acad Sci USSR, 4 pp

"Zhur Tekh Fiz" Vol XVIII, No 12

Determined photoconductivity in intermetallic compounds of constant state ZnSb and Mg_3Sb_2. Gives measurements of spectral dispersion of photoconductivity and conclusions on semiconductive nature of given compound. Submitted 26 Jul 48.

19/49T33

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P.

USSR/Physics Sep 48
Photoelectromotive Force
Crystals - Photoelectric Properties

"Determination of the Signs (Hall Effect) of Photo-EMF Current," V. P. Zhuze, S. M. Ryvkin, Leningrad Physicotech Inst, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXII, No 1

Many authors have tried to use crystal-photo EMF to determine the sign (plus or minus) of photo-EMF current. However, they neglected the fact that the presence of metallic contacts necessary for measurement of crystal-photo EMF influences amplitude and

35/49T88

USSR/Physics (Contd) Sep 48

sign of the measured EMF. Proposes method in which EMF measurement will not be affected by contact PD, and constructs table for the signs (Hall effect) of photo-EMF current (Cu_2O, Se, Bi_2S_3, Bi_2Se_3, SnS, SnSe, MoS_2, etc.). Submitted by Acad A. F. Ioffe, 6 Jul 48.

35/49T88

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P. and RYVKIN, S. M.

"Oscillograph Method," Dokl. AN SSSR, 62, p. 55, 1948

Comment W-10293, 17 May 50

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

USSR/Physics - Photoconductivity 1 Oct 49

150T80

"Mechanism of Photoconductivity in Cuprous Oxide," V. P. Zhuze, S. M. Ryvkin, Leningrad Physicotech Inst Acad Sci USSR, 4 pp

PA

"Dok Ak Nauk SSSR" Vol LXVIII, No 4

Applies earlier works by S. M. Ryvkin ("Dok Ak Nauk SSSR" Vol LXVIII, No 3, 1949 and "Zhur Tekh Fiz" Vol XVIII, p 1,521, 1948) and by V. P. Zhuze ("Dok Ak Nauk SSSR" Vol LXII, No 5, 1948). Finds relationship between "darkness" conductivity (sigma) and quantum output of the internal photoeffect, indicating "perforated" character of photoconductivity. Calculates

150T80

USSR/Physics - Photoconductivity (Contd) 1 Oct 49

theoretically the coefficient (beta) characterizing quantum output of internal photoeffect. Calculates stationary number of electrons for cases of low and high temperatures. Submitted by Acad A. F. Ioffe 16 Jul 49.

150T80

ZHUZE, V. P.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

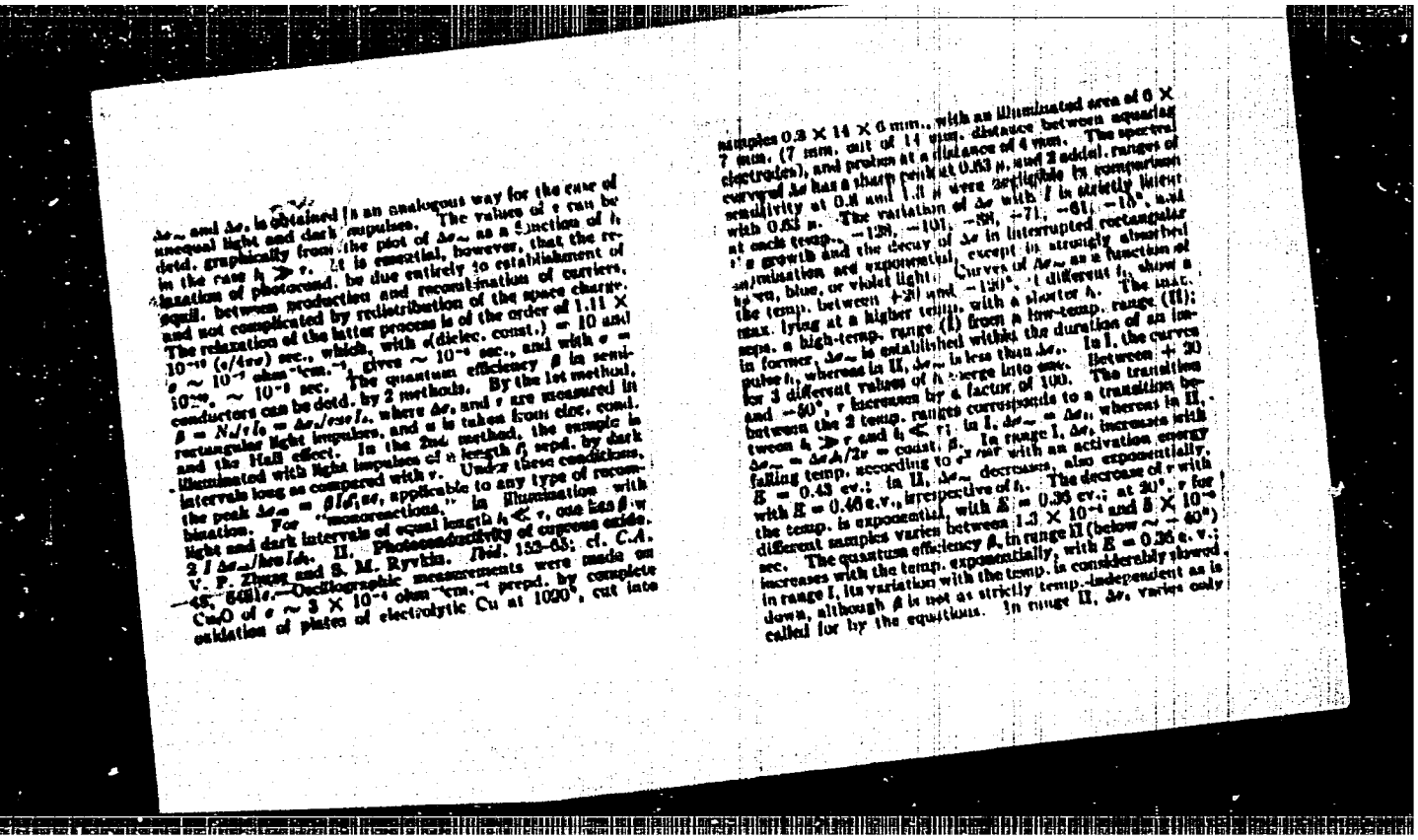
CA

ZHUZE, V. P.

Investigation of photoconductivity. I. Status of the problem and methods of investigation. S. M. Ryvkin (Phys.-Tech. Inst., Leningrad). *Zhur. Tekh. Fiz.* 20, 139-61(1950).—The stationary photocond. $\Delta\sigma$ is detd. by $\Delta\sigma_s = e u \tau \beta k I$, where e = electron charge, u = mobility of the current carriers, τ = their mean life, k = absorption coeff., I = incident light intensity, β = photoeffect coeff., which is identical with the quantum yield if I is expressed in no. of quanta. This simple relation holds for a specific photocond. at a given point, but is not directly applicable to measurements on samples where, in particular, I varies from one point to another. The problem is susceptible of no simple solution in the case of illumination parallel to the elec. field. In perpendicular orientation of light and field, $\Delta\sigma_s = (h/l) e u \tau \beta I_0 (1 - e^{-kd})$, where l = distance between the electrodes (thickness along the elec. field), d = thickness along the path of the light, h = dimension in the direction perpendicular to both l and d, and I_0 = incident intensity at the surface. For sufficiently thick samples, $kd \gg 1$ and $\Delta\sigma_s = (h/l) u e \tau I_0 = (h/l) e u N_s$ where N_s = stationary no. of carriers per unit illuminated surface. This is valid for a "monoreaction", where the rate of recombination of the carriers is proportional to the 1st power of their concn. For a "bireaction" the rate of change of the no. n_s of photoelectrons is $dn_s/dt = k\beta I - \gamma n_s^2$, and in the stationary state $n_s = (k\beta I/\gamma)^{1/2}$, valid for thin layers in which I is const. In thick samples, diffusion of the carriers is equilibrated by the elec. field of the space charge $\rho = -e(n_s - n_h)$, where n_h = concn. of pos. holes, i.e., because $n_s \neq n_h$, recombination is no more strictly bimol. Consequently, interpretation of photocond. measurements in thick samples is straightforward only in the instance of a 1st-order recombination law. In the method of rectangular light impulses (Doklady Akad. Nauk S.S.S.R. 58, [illegible] (1947); C.A. 43, [illegible]) the effect of contact perturbations near the electrodes is eliminated by illumination of only the central part of the sample ("probe" method); if the photocond. due is small as compared with the dark cond. σ, the peak value of the alternating photocond. $\Delta\sigma_\sim = \tau(1 + R)^2/r_0 RV$, where v = peak value of the alternating component of the voltage across the resistance R, and r and r_0 = dark resistance of the sample and of its central part. This can be also written in the form $\Delta\sigma_\sim = V_0/RW_0^2$, where W_0 = voltage drop in the central part of the sample in the dark. The influence of surface perturbations of the type of surface levels is eliminated if the samples are sufficiently thick in comparison with the surface layer, and the light penetrates well below the surface layer. In terms of the Debye radius $1/\kappa$, these conditions are $d \gg 1/\kappa$ and $1/k \gg 1/\kappa$. For a 1st-order recombination law, the rate of change of the concn. n_s of the carriers is $dn_s/dt = k\beta I - (n_s/\tau)$, and, for the surface concn. N_s (per unit illuminated surface area) $dN_s/dt =$ $(k\beta \int_0^\infty I dx) - (N_s/\tau)$, integrated to $N_s = \beta I_0 \tau (1 - e^{-t/\tau})$. When, after prolonged illumination, the light is turned off, the decrease follows $N_t = \beta I_0 \tau e^{-t/\tau}$. In illumination with light and dark impulses of equal length t_1, if $t_1 \gg \tau$, then $\Delta\sigma_m = \Delta\sigma_s$. If the condition $t_1 \gg \tau$ is not fulfilled, $\Delta\sigma_m = \Delta\sigma_s (1 - e^{-t_1/\tau})/(1 + e^{-t_1/\tau})$, and hence $\Delta\sigma_s - 2a$, where $a = \Delta\sigma_m e^{-t_1/\tau}$, or $\Delta\sigma_m = \Delta\sigma_s \tan h(t_1/2\tau)$, or $\Delta\sigma_m = \Delta\sigma_s \tan h(1/4\tau f)$ in terms of the frequency f of the modulation of the light. A somewhat more complex expression for the relation between

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

CA

3

The exciton character of absorption of light and impurity photoconductivity. V. P. Zhuze and S. M. Ryvkin (Leningrad Phys.-Tech. Inst.). *Doklady Akad. Nauk S.S.S.R.* 77, 241–4(1951).—The conclusion that the photocond. of Cu_2O is of an impurity character, established by previous exptl. work (*ibid.* 68, 487(1949); *Zhur. Eksptl. Teoret. Fiz.* 18, 1521(1948); 19, 295(1949); 20, 152(1950); *C.A.* 43, 4824; 44, 2842g) and confirmed by observations of Okada and Uno (*C.A.* 44, 5607g) that, in the vicinity of the limit of the absorption band at 0.63 μ, the photocond. increases with the content of excess O, involves the difficulty that, in this range, the absorption is much too high to be attributed to the very small no. of electrons on the impurity acceptor levels. This difficulty is resolved, without abandonment of the previously assumed zone scheme, by attributing the transition of electrons from the impurity level M to the conduction zone, not to direct action of the light quanta on the impurity atoms, but to secondary absorption of light by the main crystal lattice. The exciton thus produced can either recombine or meet an ionized impurity center and transmit its energy, thus lifting an electron from the impurity level to the conduction zone; this constitutes a sort of "exciton collision of the 2nd kind." At low temps., the concn. of electrons in M is small, and hence practically all the excitons will recombine, and the photoelec. quantum yield will be small. At a sufficiently high temp., the no. of electrons on M will be high, and practically all the excitons will end in collisions of the 2nd kind, with a resulting max. quantum yield. If the no. p of excitons produced in unit vol. per unit time is proportional to the light energy bI absorbed, $p = \nu bI$, where the factor ν expresses the "exciton yield." With τ' and τ'' denoting, resp., the mean life of the exciton until a collision of the 2nd kind and a recombination, and n = concn. of ionized impurity atoms (electrons in M), v = velocity of the exciton, q = cross section for the collision, one has $\tau' = 1/nvq$; the mean life in the intermediate case, where both recombination and collisions of the 2nd kind are significant, is $\tau = \tau'\tau''/(\tau' + \tau'')$, and the no. p_1 of excitons effective in lifting electrons into the conduction zone is $p_1 = p\tau/(\tau + \tau')$, where $\tau = 1/bq\tau''$, or, finally, $p_1 = \nu bI/n/(s + n)$. From the kinetic equations, in the case where the trapping levels M' are metastable, and the photocond. is of the hole type, the observed quantum yield is found $\beta = (\nu\eta/2)n/(s + n)$, where n = concn. of the pos. holes. At low temps., $n \ll s$, and $\beta = (\nu\eta/2s)n \sim e^{-\epsilon/kT}$, whereas at high temps., where n can exceed s, $\beta = \nu\eta/2$ = const. This temp. dependence of β is in agreement with previous observations. The same mechanism of photocond. may hold in alkali halide crystals, and the internal photoelec. effect may be contingent on collisions of the 2nd kind between excitons and ionized F centers. It is not observed at ordinary temps. in the region of the absorption, but should appear on simultaneous illumination with the wave length of the F band or on heating. N. Thon

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

USSR/Physics - Semiconductors Jan/Feb 52

"Photoconductivity of Cuprous Oxide," V. N. Zhuze, S. M. Ryvkin, Leningrad Tech Inst, Acad Sci USSR

"Iz Ak Nauk SSSR, Ser Fiz" Vol XVI, No 1, pp 93-107

Attempts to prove that specific stationary photocond may be characterized by: absorption coeff, coeff of "quantum output," mean lifetime of photocurrent carriers and mobility of photocurrent. Refers to previous works (cf. S. M. Ryvkin, "Dok Ak Nauk SSSR" Vol LXVIII, 673, 1949; "Zhur Eksper i Teoret Fiz" 20, 139, 1949) and mentions recent expts by Ye. F. Gross and N. A. Karryev, who are

218T90

USSR/Physics - Semiconductors (Contd) Jan/Feb 52

believed to have found the optical spectrum of the exciton. (cf. Ye. F. Gross and N. A. Karryev, "Optical Spectrum of the Exciton," "Dok Ak Nauk SSSR" Vol LXXXIII, 3, 1951). Indebted to A. F. Ioffe.

218T90

ZHUZE, V. N.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P.

USSR/Physics - Semiconductors, Mar/Apr 52
Metallic

"Semiconductor Properties of Some Metallic Compounds," B.I. Boltaks, and V.P. Zhuze, Leningrad Phys-Tech Inst, Acad Sci USSR

"Iz. Ak Nauk, Ser Fiz" Vol XVI, No 2, pp 155-168

Results of investigations of elec and thermoelec properties of Mg_3Sb_2, Mg_2Sn, Cs_3Sb and $SbZn$ proved their semiconducting nature. Authors' expt'l data on Mg_3Sb_2 and Mg_2Sn are in agreement with those obtained for Mg_3Sb_2 by N.F. Mott and H. Jones, ("The Theory of the Properties of Metals and Alloys," Oxford, 1936) and for Mg_2Sn by T.A. Kontorova ("Zhur Tekh Fiz" 18, 1948).

220T89

220T89

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P.

USSR/Physics - Thermoconductivity Aug 52

"A Method for Rapidly Determining the Coefficient of Temperature Conductivity of Solids and Liquids," V. P. Zhuze, A. R. Regel, Leningrad Phys-Tekh Inst, Acad Sci USSR

"Zhur Tekh Fiz" Vol 22, No 8, pp 1376-1384

Authors state that all available methods require a long time for measurement. In developing a nonstationary method of detg the coefr of temp. cond of solids and liquids the authors endeavored to attain reliability, rapidity and simplicity of measurement of small-size samples. Received 8 May 52.

226T101

226T101

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

USSR

537.311.33 : 538.63

8275. A method of measuring the Hall effect in semiconductors. V. P. ZHUZE and S. M. RYBKIN. *Zh. tekh. Fiz.*, 23, No. 5, 913–15 (1953) *In Russian.*

The shortcomings of d.c. measurements of the Hall e.m.f. are reviewed and an a.c. method is suggested for overcoming them. The magnetic field and the current through the specimen were both alternating and of different frequencies, the Hall e.m.f. being measured at 20 c/s through a narrow-band (0.3 c/s) amplifier with an electrometer input. A detailed description and circuitry of this amplifier and associated apparatus is given. The sign of the Hall effect is determined from oscilloscopically displayed [illegible] used to demonstrate the [illegible] and the report

V. V. ZAKHAROV

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

IOFFE, A.F.; ZHUZE, V.P., redaktor; SMIRNOVA, A.V., tekhnicheskiy redaktor

[Semiconductors in modern physics] Poluprovodniki v sovremennoi fizike. Moskva, Izd-vo Akademii nauk SSSR, 1954. 355 p. [Microfilm] (Semiconductors) (MLRA 8:3)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.

USSR/Physics - Conductivity

Card 1/1 : Pub. 22 - 12/49

Authors : Amirkhanov, Kh. I., Active member of the Acad. of Scs. of the AzSSR; Daibov, A. Z.; and Zhuze, V. P.

Title : Regarding the question about the change of heat conductivity of semi-conductors in a magnetic field

Periodical : Dok. AN SSSR 98/4, 557-560, Oct. 1, 1954

Abstract : Experimental studies of changes in heat conductivity of semi-conductors in magnetic fields are described. The purpose of these studies was to determine the causes of the observed deviations (from the theory) in the heat conductivity of some semi-conductors (such as Te, MoS_2, etc.) in magnetic fields. Twenty references (1901-1952). Table; graph.

Institution : Physical Laboratory of the Dagestan branch of the Acad. of Scs. of the USSR

Submitted : ...

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

USSR/ Physics - Crystallography

Card 1/1 Pub. 22 - 12/56

Authors : Zhuze, V.P.

Title : On a relationship between the thermal resistance of crystals and the coefficient of their linear expansion.

Periodical : Dok. AN SSSR 99/5, 711-714, Dec. 11, 1954

Abstract : An experimental study of the dependence of the thermal resistance of crystals and their thermal linear expansion is presented. The study was conducted in the light of the "phonon" theory which connects the thermal resistance and the thermal linear expansions of crystals with anharmonic oscillations of crystal lattice atoms. The experiments, conducted with various crystal substances, proved the linear dependence of a crystal thermal resistance on the square of the coefficient of a linear expansion $(\frac{1}{\alpha} - \alpha^2)$. Sixteen references: 7 - USSR (1946-1953). Diagram; table.

Institution: The Laboratory of Semi-Conductors of the Acad. of Scs of the USSR.

Presented by: Academician A.F. Ioffe, July 31, 1954.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Zhuze, V.P.

ZHUZE, V.P., kandidat fiziko-matematicheskikh nauk, redaktor; VERE - MEYENKO, G.D., bibliograf; GUSENKOVA, Ye.I., bibliograf; FILIPPOVICH, V.N., redaktor; ARONS, R.A., tekhnicheskiy redaktor.

[Scientific literature on semiconductors; bibliography for 1920-1952] Nauchnaia literatura po poluprovodnikam; bibliografiia 1920-1952. Moskva, 1955. 631 p. (MLRA 8:12)

1. Akademiya nauk SSSR. Institut poluprovodnikov, Leningrad. (Bibliography--Semiconductors)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.

USSR/Physics Electrical properties FD-3103

Card 1/1 Pub. 153 - 2/24

Author : Zhuze. V. P.; Regel', A. R.

Title : Electrical properties of alloys in the system NiTe-$NiTe_2$

Periodical : Zhur. tekh. fiz., 25, No 6 (June), 1955, 978-983

Abstract : The authors investigate electrical conductivity, its temperature coefficient, thermoelectromotive force, and temperature conductivity of the system of alloys with composition from NiTe to $NiTe_2$. They note that the problem of clarifying the relation between electrical properties of chemical compounds and their crystallochemical characteristics is presently a pressing one. They acknowledge helpful discussions with Academician A. F. Ioffe, and help of scientific associates V. M. Sergeyev and Ye. L. Shturm and laboratory assistant V. M. Medvedev. Nine references.

Institution :

Submitted : February 1, 1955

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Z-ZHUZE, V.P.

KOBLENTS, A. [Goblenz, Abraham]; OUYENS, G. [Owens, Harry L.]; ZHUZE, V.P., [translator], red.

[Transistors; theory and applications. Translated from the English] Tranzistory; teoriia i primeneniia. Perevod s angliiskogo pod redaktsiei V.P.Zhuze. Moskva, Izd-vo inostrannoi lit-ry, 1956. 396 p. (MIRA 11:4)

(Transistors)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

9(6) PHASE I BOOK EXPLOITATION SOV/2506

Zhuze, Vladimir Panteleymonovich

Poluprovodnikovyye materialy; elementy - poluprovodniki (Semiconductor Materials; Elements of Semiconductors) Leningrad, Leningradskiy dom nauchno-tekhnicheskoy propagandy, 1957. 101 p. (Series: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR. Seriya "Poluprovodniki," vyp. 17) 15,000 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut poluprovodnikov, and Leningrad. Dom nauchno-tekhnicheskoy propagandy.

Tech. Ed.: D. P. Freger; Editorial Board: A. F. Ioffe, Academician (Chief Ed.); M. S. Sominskiy, Candidate of Physical and Mathematical Sciences (Deputy Chief Ed.); Yu. P. Maslakovets, Doctor of Physical and Mathematical Sciences; G. A. Smolenskiy, Doctor of Physical and Mathematical Sciences; S. S. Shalyt, Doctor of Physical and Mathematical Sciences; A. R. Regel', Candidate of Physical and Mathematical Sciences; V. K. Subashiyev, Candidate of Physical and Mathematical Sciences; K. A. Shagurin, Engineer; and Sh. D. Achkinadze, Engineer.

Card 1/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Semiconductor Materials; (Cont.) SOV/2506

PURPOSE: This book is intended for engineers and technologists who have occasion to use semiconductor materials.

COVERAGE: The book is 17th in a series of 18 published by Leningradskiy Dom nauchno-tekhnicheskoy propagandy (Leningrad House of Scientific and Technical Propaganda) and the Institut Poluprovodnikov AN SSSR (Semiconductor Institute, Academy of Sciences, USSR) under the general title, Poluprovodniki (Semiconductors). It is also the revised and supplemented second edition of an issue entitled Poluprovodniki i ikh tekhnicheskoye primeneniye (Semiconductors and Their Technical Application). This book deals with the semiconductor properties of elements and gives basic data on their structural, electrical, thermoelectrical, galvanomagnetic, and optical properties. No personalities are mentioned. There are 104 references: 44 Soviet, 56 English, 1 Swedish and 3 German.

TABLE OF CONTENTS:

Card 2/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

SOV/2506

Card 3/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Semiconductor Materials; (Cont.) SOV/2506

Bibliography 97

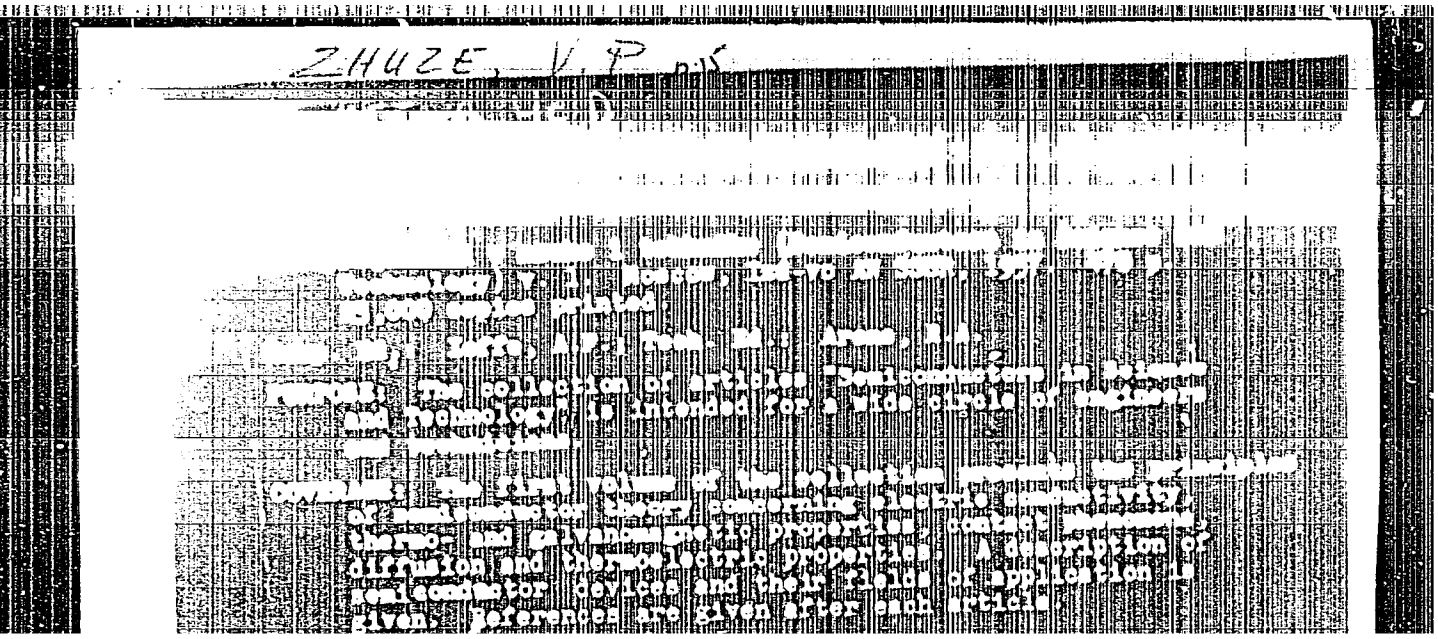
AVAILABLE: Library of Congress

TM/jb
10-27-59

Card 4/4

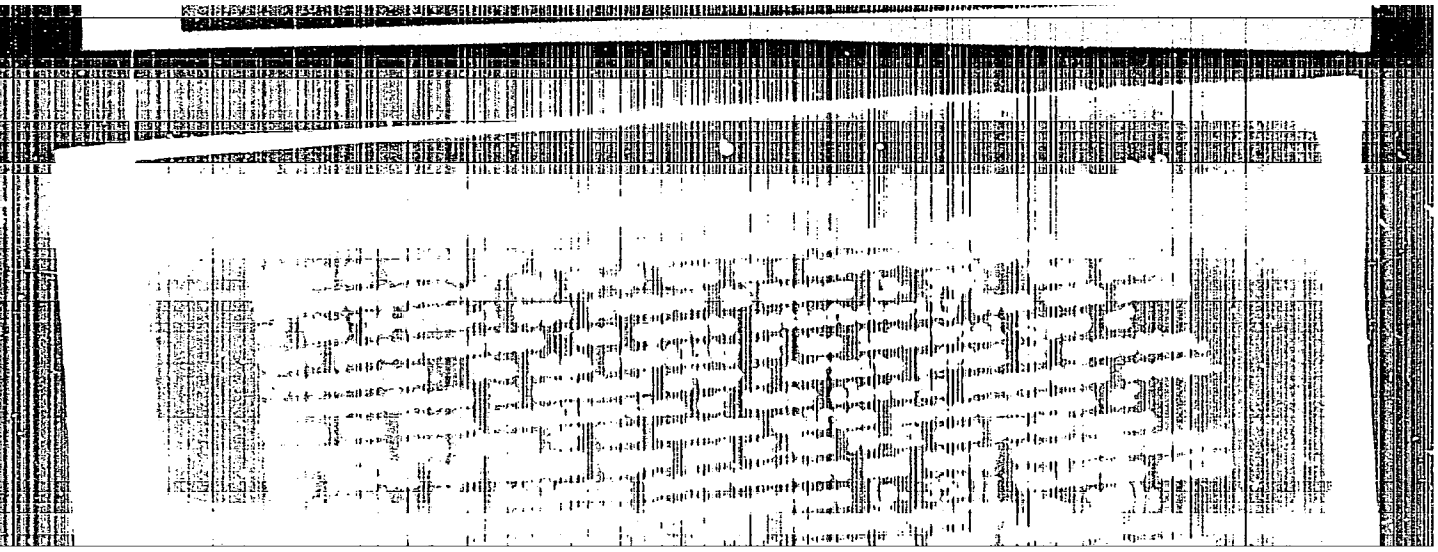
APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



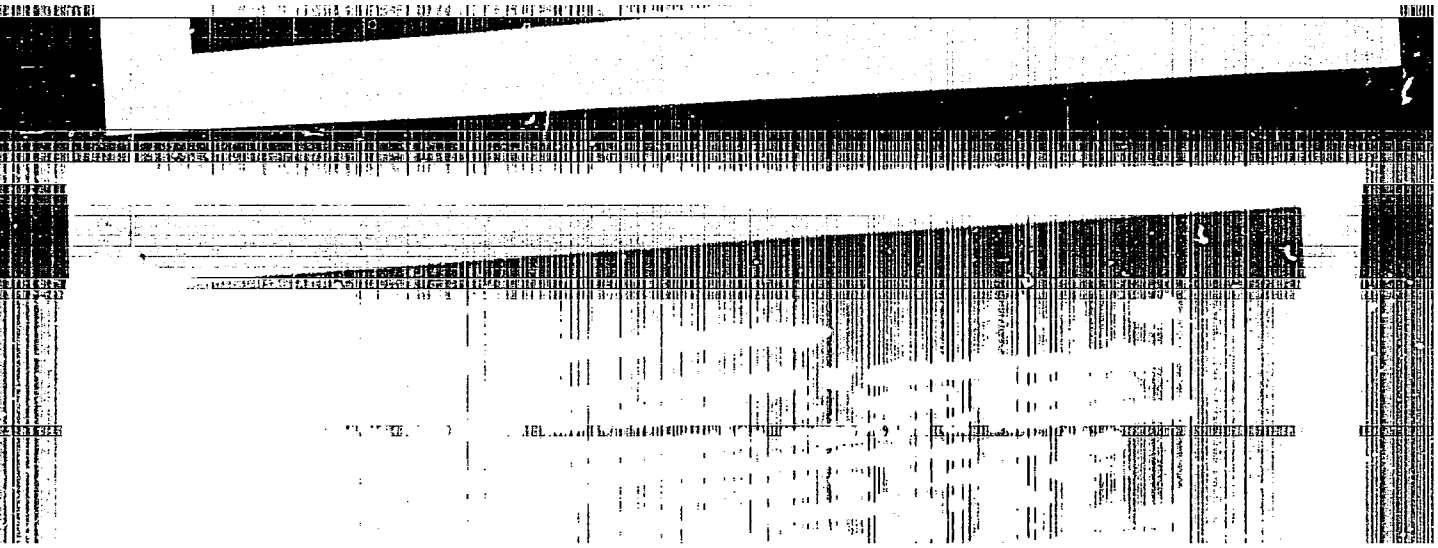
APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1992

AUTHOR ŽUZE,V.P., PIKUS,G.E., SOROKIN,O.V.

TITLE On the Problem of the Influence exercised by an Exterior Electrostatic Field on the Velocity of Surface Recombination in Germanium.

PERIODICAL Žurn.techn.fis, 27, fasc.1, 23-29 (1957)

Issued: 2 / 1957

Experimental method and results: The velocity of surface recombination was measured by the methods developed by O.V.SOROKIN, Zurn.techn.fis.26,11 (1956). On this occasion the effective diffusion lengths L_α were experimentally determined, and from the values found in this way the velocities of surface recombination were computed. Investigations were carried out with rectangular plates made of monocrystalline n- and p-germanium. The upper boundary surface of the sample served for the mounting of metal probes: phosphorus bronze for n-germanium and tungsten for p-germanium. On the upper boundary surface of the sample a rectilinear stripe of ~ 0,005 cm width, which was vertical to the longitudinal axis of the sample, was illuminated. A mica plate which was coated with silver on one side and had a thickness of from 0,0022 - 0,0030 cm was pressed or pasted on to the lower boundary surface. An electric voltage of up to 6 kV was applied to this silver coating. The block scheme of the measuring device is shown in form of a drawing.

A diagram illustrates the typical curve which is obtained on the screen of the oscillograph by bringing a probe into contact with the sample. When applying an exterior electric field to the sample the curve partly changed its shape,

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

apparently because of various transition processes in the radiotechnical device. After less than 10 sec the curve again assumed its previous shape which indicates that the velocity s_2 of surface recombination on the lower boundary surface is constant. This constance of s_2 was observed in connection with all methods of working the surface. A further diagram shows typical curves for $\Delta p = f(x)$, where Δp is the concentration of the charge carriers which are not in equilibrium.

Conclusions: At steadied conditions the velocity of the surface recombination of the current carriers in germanium does not change under the effect of an exterior electrostatic field. This is true up to concentrations of $\sim 10^{13}$ cm^{-2} of the current carriers induced on the germanium surface. Conductivity of the sample on this occasion remains practically unchanged. The induced current carriers essentially fill the surface levels, their density is considerably more than $10^{13}/cm^2$. The outer levels play no important part in surface recombination which takes place on the interior levels. In semiconductors there apparently are several interior levels at different heights.

INSTITUTION: Institute for Semiconductors of the Academy of Science in the USSR, LENINGRAD.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.

57-6-3/36

AUTHOR ZHUZE, V.P., PIKUS, G.Ye., SOROKIN, O.V.

TITLE The Determination of the Surface Recombination Rate by Means of a Change of Semiconductors Resistance in the Magnetic Field. (Metod izmereniya skorosti poverkhnostnoy rekombinatsii po izmeneniyu soprotivleniya poluprovodnika v magnitnom pole -Russain)

PERIODICAL Zhurnal Tekh .Fiz., 1957, Vol 27, Nr 6, pp 1167-1173 (U.S.S.R.)

ABSTRACT A new method for the measurement of the velocity of surface recombination is described. It is based on the dependence of the resistance of a semiconductor sample in a magnetic field on the recombination velocity on its surfaces. The results of experimental chekings of this method are given. They agree well with theoretical predictions; i.e. they fully prove the theoretical final conclusions mentioned in the work of one of the authors (G.Ye. Pikus, T, 1956, Vol 26, pages 22-50) with regard to the dependence of the semiconductor-resistance in the magnetic field on the velocities of the surface-recombinations, the voltage and the frequency of the electric field, as well as on the voltage of the magnetic field. The method presented can be used for the investigation of the influence of an exterior electrostatic field and of the outer medium on the velocity of surface recombination. At present such experiments are carried out and will be published later on various works.
(1 table, 6 illustrations and 3 Slavic references).

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

The Determination of the Surface Recombination Rate by Means of a Change of Semiconductors Resistance in the Magnetic Field. 57-6-3/36

ASSOCIATION Institute for Semiconductors of the Academy of Science of the USSR
PRESENTED BY
SUBMITTED 29.12.1956
AVAILABLE Library of Congress
Card 2/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P. (Cand.Physical and Mathematical Sci.)

"Application of the Hall Effect in Semiconductors"

(Use of Semiconductors in Instrument Making; Transactions of a Conference) Moscow, Mashiz, 1958. 258 p.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

AUTHORS: Zhuze, V. P., Tsidil'kovskiy, I. M., Bartnitskaya, T. S. SOV/57-58-8-4/37

TITLE: Thermomagnetic Phenomena in Silver Telluride (Termomagnitnyye yavleniya v telluride serebra)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Nr 8, pp. 1646 - 1650 (USSR)

ABSTRACT: This is a study of the Nernst-Ettinghausen-effect, of the thermo e.m.f., of the electric conductivity and of the Hall-(Kholl) effect in Ag_2Te and AgTe in the temperature interval of 120-600°K. The measuring methods are described in reference 5. The nature of the variations of the temperature dependence of σ and R agrees with observations made by Appel(Ref 8). Diagrams showing the temperature dependence of the dimensionless fields of the transverse and of the longitudinal Nernst-Ettinghausen effect φ_y and φ_x, respectively, and the temperature coefficient α of the thermo e.m.f. are given. The negative sign and the great absolute value of φ_y at temperatures below 200°K can be explained by the effect of phonon

Card 1/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

drag $\ell_{U_x} > C$. This indicates a considerable effect exerted by the phonon drag upon the longitudinal Nernst-Ettinghausen effect at low temperatures. In the range of 200-420°K $\ell_{U_y} > 0$. ℓ_{U_y} varies about as $T^{-2,5}$ and hence also $u \sim T^{-2,5}$. It is assumed that m = 0 that is to say that a carrier scattering on acoustic low-frequency oscillations corresponding to a covalent type of binding is prevalent. The relation $u \sim T^{-2,5}$ can be explained by a multiple phonon scattering of the carriers. Around 420°K the ℓ_{U_y} field decreases markedly and changes its sign. At a further temperature rise of up to $T \simeq 490$°K it first increases again, decreasing subsequently and passing through a minimum at $T \approx 550$°K. The jump-like variation of ℓ_{U_y} occurs at a temperature near the phase transition temperature. The inversion of the sign in the longitudinal Nernst-Ettinghausen effect in the point of phase transition undoubtedly indicates a change in the type of binding. The negative sign of ℓ_{U_y} above 420°K indicates that α-Ag_2Te is a semiconductor with a prevailing ion binding

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

the Debye temperature of which is less than 420°K. The theory of Howarth-Sondheimer (Ref 15) was not convincingly substantiated by experiments. According to the opinion of the authors it is unsuited for the computation of the parameters of semiconductors. The section of the thermo e.m.f. versus temperature curve shows a peculiar course in the range of high temperature. α is positive at $T \simeq 395°K$, reaches a maximum at 490°K (320μV/degree). At a further rise of temperature it decreases a little. This behaviour of $\alpha(T)$ can be explained by the assumption of a superposition of the electron thermo e.m.f. by a relatively great thermo e.m.f. caused by the mobile silver ions(Ludwig-Soret-effect) at high temperatures. The experimental results obtained from AgTe are given in short. The electric conductivity and the Hall-(Kholl) constant of AgTe vary continuously, whereas R decreases with a rise of temperature above 250°K and σ increases in the same temperature range. Contrary to evidence obtained by Appel R inverses it sign. The modification of the sign in the Hall-effect at a temperature rise suggests a transition into the range of mixed conductivity. The repeated inversion of the sign (from minus to plus) at 455°K is apparently determined by the Ludwig-

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Thermomagnetic Phenomena in Silver Telluride SOV/57-58-8-4/37

Soret-effect as in Ag_2Te. It is shown that in AgTe ℓ_{U_y} varies continuously in the whole temperature range, remaining negative everywhere. Below 200°K the functions $\ell_{U_y}(T)$ and $\alpha(T)$ substantiate an influence of the phonon drag upon both effects. The law governing the decrease of α, reads as in Ag_2Te: $\alpha \sim T^{-3}$. The results confirm the existence of a prevailing ion binding. There are 2 figures and 17 references, 9 of which are Soviet.

SUBMITTED: December 12, 1957

Card 4/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

AUTHORS: Zhuze, V. P., Kontorova, T. A. SOV/57-58-8-20/37

TITLE: Correlation of Strength and of Heat Conductivity of Non-Metallic Crystals (O korrelatsii mezhdu tverdost'yu i teploprovodnost'yu nemetallicheskikh kristallov)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Nr 8, pp. 1727 - 1733 (USSR)

ABSTRACT: This paper presents a comparison of the properties of the group of ternary semiconductor compounds with the general formula ABX_2, and with a chalkopyrite structure exhibiting the properties of such non-metallic crystals. Such crystals are produced by the elements of the IV-B column of the periodic system and by the binary compounds of an $A^{III}B^{V}$ type, which exhibit the same covalent binding and the same lattice structure. A comparison of the data bearing on the strength and the heat conductivity of these three groups shows that the micro-strength H and the heat conductivity κ of these substances are correlated in a definite way. κ decreases as H. On the other hand, H shows a definite decrease with the increase of the interatomic distance. Such a correlation between H and κ, however, is also found in the halide compounds of alkali metals,

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

although these compounds exhibit a different type of chemical binding, mainly of an ionic kind, and a different crystal lattice (NaCl structure). The considerations concerning this correlation advanced are by no means intended to be a consistent theory to these phenomena. The transition from light to heavier elements or compounds in the homologous series in question (increase of $\bar{M}$) is accompanied by a reduction of the lattice energy U_o and an increase of the lattice constant r_o. As specified by formula (8) for κ the heat conductivity must decrease systematically in accordance with the experiment. Since, however, this transition is also accompanied by a reduction of the coefficient α of the quasi-elastic binding, which determines H a definite correlation between H and κ must exist. There are 2 figures, 2 tables, and 6 references, 5 of which are Soviet.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors, AS USSR, Leningrad)

SUBMITTED: December 12, 1957

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P.

AUTHORS: Zhuze, V. P., Sergeyeva, V. M., Shtrum, Ye. L. 57-2-3/32

TITLE: New Semiconducting Compounds (Novyye poluprovodnikovyye soyedineniya).

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 2, pp. 233-236 (USSR).

ABSTRACT: In the investigation of binary semiconducting-compounds with the general stoichiometric formula ABX_2 the authors synthetically produced 4 new compounds of the following composition: $A^{I}B^{VIII}X_2^{VI}$, where A is either Cu or Ag, B - Fe and X either Se or Te. All four compounds, as was to be expected, are semiconductors. The analysis of the nature of the chemical linkage in these compounds indicates the possibility of a sp^3-hybridization (mixture of valence states) of the electron-states in the crystal. From the scheme given here is to be seen that the chemical linkage in compounds of this type probably takes place by means of electrons being in the state of sp^3-hybridization. $CuFeSe_2$, $CuFeTe_2$, $AgFeSe_2$ and $AgFeTe_2$ were produced by direct melting of the components as well as from corresponding binary compounds (which were previously produced by a direct synthesis of the components). The radiographic analysis (performed by R. A. Zvinchuk in the Laboratory for Radiography in the Institute for Semiconductors AS USSR) proved that the samples were monophase. The cast samples of $AgFeSe_2$

Card ~~1/4~~

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

New Semiconducting Compounds.

and $AgFeTe_2$ were more closely examined. The photographs were taken in the case of $FeK_{\alpha,\beta}$-radiation. The roentgenograms were indicated under the assumption of a tetragonal lattice-symmetry. The great deviation of the c/a-values from the quantity (c/a=2) ideal for the chalcopyrite-structure as well as the occurrence of indices of the type h + k + l = 2n + 1 (forbidden for the space-group $D_{2d}^{12} = I\bar{4}2d$) excludes the possibility to ascribe to these compounds the type of the chalcopyrite-structure (to which the analogue of these compounds - $AgFeS_2$ belongs). The volume relation of the elementary cells in $AgFeSe_2$ and $AgFeTe_2$ (elementary cells) agrees with the relation of their molecular weights and the relation of the third power of the radii of Se^{2-} and Te^{2-}. This can only indicate a similarity of the chemical linkage and an exact agreement of the structures with the conceptions from the theory of the densest packing. The melting temperatures T_{melt}, the microstrength H in kg/mm^2, the electric conductivity in $ohm^{-1} \cdot cm^{-1}$, the Hall constant R in cm^3/C and the thermo-electromotive force α in $\mu V/^oC$ with regard to Pb for all compounds were determined. For several compounds the activation-energy of the current-carriers in eV was determined according to the dependence of the Hall constant on temperature. It is shown that the compounds (which were investigated here)

Card 2/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

New Semiconducting Compounds. 57-2-3/32

like those of the $A^{III}B^{V}$ - type in the case of a deviation of their composition from the stoichiometry do not change the type of conductivity. The electric properties of the $AgFeTe_2$-compound were more closely investigated here. In samples with a current-carrier-concentration of the order of magnitude 10^{18} cm^{-3} the mobility of the electrons is higher than 2000 $cm^2/V.sec$. The dilatometric analysis of $AgFeTe_2$ at 140-150°C shows an isothermal jump of the volume which indicates the occurrence of a first-order phase transition. The modification of the volume in the phase transition. The modification of the volume in the phase transition is very high and amounts to 0,55%. The activation-energy of the current-carriers also undergoes great changes at the point of transition. Until the transition-temperature ΔE = 0,28 eV, afterwards = 0,58 eV. At the author's request P. V. Gul'tyayev measured the course of temperature of the thermal conductivity in the $AgFeTe_2$- and $AgFeSe_2$-samples with large crystals.

The coefficient of thermal conductivity in both compounds at room temperature approaches 0,007 cal/cm.degree.sec.
There are 5 figures, 2 tables, and 9 references, 5 of which are Slavic.

ASSOCIATION: Institute for Semiconductors AS USSR. Leningrad (Institut poluprovodnikov AN SSSR. Leningrad).

Card 3/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

24(6). SOV/57-28-10-1/40

AUTHORS: Zhuze, V. P., Sergeyeva, V. M., Shtrum, Ye. L.

TITLE: Semiconductor Compounds With the General Formula ABX_2 (Poluprovodnikovyye soyedineniya s obshchey formuloy ABX_2)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, Vol 28, Nr 10, pp 2093-2108 (USSR)

ABSTRACT: Ternary compounds with the general formula ABX_2 crystallize in a chalkopyrite structure. They were found for the first time synthetized by H. Hahn (Khan) and coworkers in 1953 (Ref 1). In ABX_2 compounds a formation of the sp^3 hybrid states and the tetrahedric distribution of atoms corresponding to this type of compound is according to the scheme describing the formation of chemical compounds only possible in such cases, where in the compound one of the elements of the third group of the periodic system, or iron, represents the trivalent element B. Antimony and bismuth are incapable of entering such a compound. Fundamental facts, a description of the method, and of the synthesis are presented. Investigations carried out in the X-ray laboratory IPAN by R. A. Zvinchuk showed that the samples of the

Card 1/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

group of $A^{I}B^{III}X_2^{VI}$ compounds are all of monophase composition and a chalkopyrite structure. The compounds $CuTlTe_2$, $AgTlSe_2$, and $AgTlTe_2$ were for the first time produced synthetically. The X-ray analysis showed that $A^{I}B^{VIII}X_2^{VI}$ compounds are also of monophase nature. Cast samples of $AgFeSe_2$ and $AgFeTe_2$ were examined more closely with the help of $FeK_{\alpha\beta}$ radiation. The $A^{I}B^{V}X_2^{VI}$ compounds: $CuSbSe_2$, $CuBiSe_2$, $AgSbSe_2$, $AgSbTe_2$, $AgBiSe_2$, and $AgBiTe_2$ also proved to be of a monophase nature. Without exception the compounds investigated were found to be semiconductors. In compounds with the elements of the V. group the chemical bond is very likely not realized by electrons in the hybrid state sp^3, but by electrons, the state of which can be expressed by a pure p-function. An octahedron near-range order of the atoms is characteristic of such a bond, as the p-bonds lie in three directions orthogonal to each other. The crystal structure of the compounds of the V. group confirms the fact that the tetrahedron distribution of atoms distinctive of sp^3

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

bonds is not found in these compounds. With this group only the octahedron distribution is realized. The compounds produced synthetically are subject to the general rules which make it possible to separate substances with intrinsic semiconduction from such with a metallic conductivity. The decision between these two alternatives is based upon the conception of the possibility of the formation of covalent bonds. The $A^{I}B^{III}X_2^{VI}$ compounds satisfy the octet rule by Kossel (Kossel') and the rule by Mooser (Mozer) and Pearson (Pirson) (Ref 19). Finally the participation of the d-electrons of the iron contained in the $A^{I}B^{VIII}X_2^{VI}$ compounds in the formation of the chemical bond and in the semiconductivity is investigated. The absence of metallic conductivity gives rise to the assumption that the d-electrons of the atoms of the transition metal are existing in discreet states in these compounds and that they form a completely occupied d-zone. It may be assumed that the great distances between the atoms of the transition metal in the crystal are hindering the formation of an incompletely occupied zone. This problem will be the subject of another paper. A. F. Ioffe,

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Semiconductor Compounds With the General Formula ABX_2 SOV/57-[illegible]-10-1/40

Member, Academy of Sciences, USSR, showed constant interest in the work and discussed it with the authors. There are 12 figures, 7 tables, and 20 references, 10 of which are Soviet.

SUBMITTED: March 10, 1958

Card 4/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.; TSIDIL'KOVSKIY, I.M.

Thermomagnetic effects in InSb. Zhur. tekh. fiz. 28 no.11:2372-2381 N '58. (MIRA 12:1)

(Indium antimonide) (Thermomagnetism)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P., kand.fiziko-matemat.nauk; GUSEVKOVA, Ye.I., bibliograf; BUBNOVA, M.L., bibliograf; ARON, G.M., red.izd-va; BOCHEVER, V.T., tekhn.red.

[Scientific works on semiconductor electronic instruments (detectors and transistors); bibliography 1945-1955] Nauchnaia literatura po poluprovodnikovym elektronnym priborам (detektory i tranzistory); bibliografiia 1945-1955. Moskva, Izd-vo Akad. nauk SSSR, 1959. 326 p. (MIRA 12:8)

1. Akademiya nauk SSSR. Institut poluprovodnikov.
(Bibliography--Transistors) (Bibliography--Electronic instruments)
(Bibliography--Semiconductors)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

24.7700
~~24(3), 24(6)~~

67395
SOV/181-1-9-17/31

AUTHORS: Zhuze, V. P., Pikus, G. Ye., Sorokin, O. V.

TITLE: Application of the Magnetostriction Effect to the Investigation of the Surface of Semiconductors

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 9, pp 1420 - 1430 (USSR)

ABSTRACT: The authors used the method of surface recombination rate measurement by means of the resistance change of a semiconductor in the magnetic field to investigate the energy surface structure of germanium. This investigation is reported here in all details. The method applied to measure the surface recombination rate is new and was introduced by the authors themselves. A description thereof is given in references 4 and 5. The aim of the investigation under review was that of demonstrating the application of this method, with two samples of n- and p-germanium being used for the purpose. Figure 1 shows the block diagram of the used setup. The method is based on the application of a formula describing the relation between the resistance change $\Delta\varrho_H$ of a thin plane sample in the magnetic field H and the recombination rates s_1

Card 1/3

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

Application of the Magnetostriction Effect to the Investigation of the Surface of Semiconductors

and s_2 on their opposite faces: $\Delta\varrho_H/\varrho_0 = 2A\mathcal{E}_\nu H \frac{s_1-s_2}{s_1+s_2+d/\tau}$, where d is the sample thickness, $\mathcal{E}_\nu$ the voltage of the main frequency ν, which is incident upon the investigated part of the sample, ϱ_0 is the resistivity without magnetic field. A is given by $A = \frac{a_n}{4}\frac{e\mu_n}{ckT}\frac{(1+b)(1+\gamma b)pn}{(n+p)(n+pb)}\frac{d}{l}$, where n and p denote the equilibrium concentrations of electrons and holes, μ_n and μ_p their drift mobility, $a_n\mu_n$ and $a_p\mu_p$ their Hall mobility, and l the length of the investigated part of the sample. It is now described how it is possible, by means of the instrument, to obtain direct oscillograms reproducing the dependence of the quantity $\frac{s_1-s_2}{s_1+s_2+d/\tau}$ on the applied field. Figures 2-5 show such oscillograms for the two samples investigated, whose characteristics are given. The next section discusses the

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

67395

Application of the Magnetostriction Effect to the Investigation of the Surface of Semiconductors SOV/181-1-9-17/31

interpretation of measuring results in detail; the results are given in the form of diagrams, and the numerical values are given in two tables. The method described is very expedient for a quick and fairly accurate determination of the field-bound change of s. A. V. Rzhanov, I. A. Arkhipova, and V. N. Bidulya (Ref 12) applied this method to investigate the modulation of s through an outer electric field. Their results, however, did not fit those by the authors in two points. This is discussed in the final part of the paper. There are 10 figures, 2 tables, and 15 references, 8 of which are Soviet.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: February 16, 1959

Card 3/3

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V. P. (Ir.)

"The Electron and Thermal Properties of In_2Te_3 Semiconductor with Defect Structure."

report presented at the International Conference on Semiconductor Physics, Prague, 29 Aug - 2 Sep 60

Institute of Semiconductors, Leningrad

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

(5)

ZHUZE, V. P., ZASLAVSKIY, A. I., PETRUSEVICH, V. A., SERGEYEVA, V. M., SMIRNOV, I. A. and SHELYKH, A. I.

Electrical and Thermal Properties on In Te - Semiconductor with Defect Structure.

report presented at the INtl. Conf on Semiconductor Physics, Prague, 29 Aug - 2 Sep 1960

Inst. of Semiconductors, Acad. Sci. USSR Leningrad

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.; SERGEYEVA, V.M.; SHELYKH, A.I.

Electric properties of an In_2Te_3 semiconductor with defect structure. Fiz. tver. tela 2 no.11:2858-2871 N '60. (MIRA 13:12)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Indium telluride—Electric properties)

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACCESSION NR: AP4013500 S/0181/64/006/002/0430/0435

AUTHORS: Devyatkova, Ye. D.; Zhuze, V. P.; Golubkov, A. V.; Sergeyeva, V. M.; Smirnov, I. A.

TITLE: The thermal conductivity of Sm, P, and their simple chalcogen compounds

SOURCE: Fizika tverdogo tela, v. 6, no. 2, 1964, 430-435

TOPIC TAGS: thermal conductivity, samarium, praseodymium, chalcogen, crystal lattice conductivity, rare earth

ABSTRACT: This paper stems from a lack of thermal-conductivity information on rare-earth compounds and their compounds that have been recently studied in considerable detail for other properties. The compounds studied (PrS, PrSe, PrTe, and SmS) were synthesized from the constituent elements by the method described in Rare Earth Research (p. 135, 223, Ed. by E. V. Kleber, N. Y., 1961), and the thermal conductivity was measured on the "A" setup of Ye. D. Devyatkova, A. V. Petrov, I. A. Smirnov, and B. Ya. Moyzhes (FTT, 2, 738, 1960). Measurements on Sm, Pr, and the indicated compounds were made in the temperature interval 80-460K.

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACCESSION NR: AP4013500

The authors found that a considerable part of the total thermal conductivity (up to 30-50%) in these substances is crystal-lattice conductivity. The temperature dependence of this lattice conductivity may be explained by two scattering processes: phonons by phonons and phonons by electrons. Orig. art. has: 6 figures, 2 tables, and 5 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AN SSSR)

SUBMITTED: 30Jul63 DATE ACQ: 03Mar64 ENCL: 00

SUB CODE: IC, SS NO REF SOV: 004 OTHER: 009

Card 2/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

GOLUBKOV, A.V.; GONCHAROVA, Ye.V.; ZHUZE, V.P.; MANOYLOVA, I.G.

Mechanism underlying transport phenomena in samarium sulphide. Fiz. tver. tela 7 no.8:2430-2436 Ag '65. (MIRA 18:9)

1. Institut poluprovodnikov AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

L 24373-66 EWT(m)/ETC(f)/EWG(m)/EWP(t) RDW/JD/JG

ACC NR: AP6010438 SOURCE CODE: UR/0386/66/003/005/0217/0219 72

AUTHOR: Zhuze, V. P.; Shalyt, S. S.; Noskin, V. A.; Sergeyeva, V. M.

ORG: Institute of Semiconductors, Academy of Sciences, SSSR (Institut poluprovodnikov Akademii nauk SSSR)

TITLE: Superconductivity of La_3Te_4

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 5, 1966, 217-219

TOPIC TAGS: superconductivity, lanthanum compound, telluride, stoichiometry, critical point, critical magnetic field

ABSTRACT: The authors show that La_3Te_4 is a superconductor of the second kind, with properties similar to the La_3Se_4 and La_3S_4, whose superconductivity was reported recently. They also show that the superconducting transition temperature of this substance depends on the technology of its preparation and is possibly connected with some deviation of the composition from the stoichiometry. The lanthanum telluride was synthesized from the components by vacuum sublimation and zone melting, using a procedure described in detail elsewhere (A. V. Golubkov et al., Neorganicheskiye materialy [Inorganic Materials] v. 2, No. 1, 1966). Two samples were tested, one pressed from previously fused material and the other prepared by melting. The critical temperatures of the two samples were 2.45 and 3.75K, respectively. The corresponding critical fields for the destruction of superconductivity were 8 and 12.5 koe, respectively. Magnetic measurements have shown that at 1.4K the Meissner effect

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

L 24373-66

ACC NR: AP6010438 2

manifested itself in fields up to 20 and 60 oe in samples 1 and 2, respectively.
The authors thank A. I. Zaslavskiy and T. B. Zhukova for the x-ray phase analysis.
Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 22Jan66/ ORIG REF: 001/ OTH REF: 002

Card 2/2 fv

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

L 22898-66 EWT(l)/EWT(m)/T/EWP(t) IJP(c) JD/HW

ACC NR: AP6006870 SOURCE CODE: UR/0181/66/008/002/0629/0631

AUTHOR: Zhuze, V. P.; Shelykh, A. I.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Hall effect in single-crystal cobalt monoxide

SOURCE: Fizika tverdogo tela, v. 8, no. 2, 1966, 629-631

TOPIC TAGS: cobalt compound, single crystal, Hall effect, semiconductor conductivity, Neel temperature, carrier density, crystal defect, hole mobility, ionic crystal, Hall mobility

ABSTRACT: To check on the mechanism of electric conductivity of CoO and other 3d-metals, whose conductivity is much lower than that expected on the basis of the Bloch-Wilson model, the authors measured the Hall effect in CoO single crystals grown at the Institute of Crystallography AN SSSR by the Verneuil method. The samples were in the form of plates measuring 6 x 4 x 0.2 mm. The electric conductivity and the Hall emf were measured by a dc null method in a magnetic field of 23,000 oe. The Hall effect could be measured in a wide temperature interval ($10^3/T$ = 1.2--3.2) above the Neel point. The temperature dependence of the Hall

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

L 22898-66
ACC NR: AP6006870

effect points to a strong increase in the carrier density with increasing temperature. The conductivity in the CoO is produced by carriers of one sign, and at sufficiently high temperatures the crystal is in practice a pure p-type semiconductor. The dominating defects in the lattice, causing the occurrence of p-type conductivity on deviation from stoichiometry, are cation vacancies which can be singly and doubly ionized. The experimental data can be well described by the theory of quasi-chemical processes, which lead to the appearance of electronic carriers in ionic crystals, under the assumption that the drift mobility of the holes depends on neither the temperature nor the density. The Hall mobility of the holes increases slightly with rising temperature and becomes practically independent of temperature at high temperatures. It amounts to 0.04--0.07 $cm^2/v\text{-}sec$ at room temperature, and is somewhat lower than that of nickel monoxide. This result does not contradict the conclusions of the existing theory of semiconductors with low mobility. The drift mobility of the holes at high temperatures (500--1000C) obtained by the authors by thermogravitational measurements of the cation vacancies in CoO, is close to the Hall mobility. Orig. art. has: 1 figure.

SUB CODE: 20/ SUBM DATE: 08Oct65/ ORIG REF: 004/ OTH REF: 007

Card 2/2 BLG

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

L 41591-66 EWT(m)/EWP(w)/T/EWP(t)/ETI • IJP(c) RDW/JD/JG

ACC NR: AP6018537 SOURCE CODE: UR/0181/66/008/006/1761/1771

AUTHOR: Golubkov, A. V; Devyatkova, Ye. D.; Zhuze, V. P.; Sergeyeva, V. M.; Smirnov, I. A.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Thermal conductivity of lanthanum and its monochalcogenites

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1761-1771

TOPIC TAGS: lanthanum, lanthanum compound, thermal conduction, rare earth metal, crystal lattice, thermal emf, temperature dependence, phonon scattering, electron scattering

ABSTRACT: This is a continuation of earlier research by the authors (FTT v. 6, 430, 1964) on the thermal conductivity of rare-earth metals and their compounds, and is devoted to a separation of the electronic and lattice components of the thermal conductivity of La, LaTe, LaSe, and LaS. The lanthanum monochalcogenites were synthesized from the constitutent elements by a method described in detail in the literature (Rare Earth Research, 223. Ed. by E. V. Kleber, NY, 1961; A. V. Golubkov et al., Neorg. mat. v. 2, 77, 1966) and were pressed into briquettes at high pressure followed by annealing. The measurement apparatus was described by the authors earlier (FTT v. 2, 738, 1960). The theoretical expressions for the two thermal-conductivity components are derived. From an analysis of the experimentally measured

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

L 41591-66

ACC NR: AP6018537

5

thermal conductivity, resistivity, and thermal emf and their temperature dependence it is deduced that an appreciable fraction of the total thermal conductivity is due to the crystal lattice. The temperature dependence of the lattice component can be attributed to the presence of two scattering mechanisms, phonons by phonons and phonons by conduction electrons. The low carrier mobility observed in the experiments is due essentially to strong electron-phonon interaction. The presently available data on LaTe, LaSe, and LaS are summarized in a table. The authors thank A. I. Zaslavskiy and T. B. Zhukova for the x-ray analysis, V. M. Muzhdaba and Ye. V. Goncharova for supplying data on the residual resistance and on the concentration, and Doctor Suchat for information on the degree of ionicity of the materials measured in this study. Orig. art. has: 7 figures, 7 formulas, and 5 tables.

SUB CODE: 20/ SUBM DATE: 03Nov65/ ORIG REF: 010/ OTH REF: 022

Card 2/2 MLP

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACC NR: AP6026689 SOURCE CODE: UR/0181/66/008/008/2390/2394

AUTHOR: Bogomolov, V. N.; Zhuze, V. P.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: The mechanism of conductivity in rutile

SOURCE: Fizika tverdogo tela, v. 8, no. 8, 1966, 2390-2394

TOPIC TAGS: titanium oxide, rutile, Hall constant, Hall effect

ABSTRACT: Sets of data on the anisotropy of electrical conductivity, Hall constant, and piezoresistance of rutile, obtained by various authors, are analyzed as functions of temperature and current carrier concentrations. The presently-accepted zone scheme of rutile is inadequate to explain the aggregate of experimental data over a broad temperature range. If it is assumed that the current carrier concentration is temperature independent above ~100°K in the samples investigated, the electrical conductivity and Hall effect data may be described by the equations of the small-radius polaron theory. A qualitative estimate of a number of parameters from the theory also yields reasonable values. The authors thank M. I. Klinger and Yu. A. Firsov for valuable discussions. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 13Jan66/ ORIG REF: 006/ OTH REF: 007

Card 1/1

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACC NR: AP7001979 SOURCE CODE: GE/0030/66/018/002/0873/0880

AUTHOR: Smolenskii, G. A.; Zhuze, V. P.; Adamyan, V. E.; Loginov, G. M.

ORG: Semiconductor Institute, Academy of Sciences of the USSR, Leningrad

TITLE: Magnetic properties of Ce, Pr, and Nd monochalcogenides at 4.2 to 1300K

SOURCE: Physica status solidi, v. 18, no. 2, 1966, 873-880

TOPIC TAGS: cerium compound, praseodymium compound, neodymium compound, magnetic property, [redacted], rare earth ion, [redacted], chalcogenide

ABSTRACT: An attempt has been made to determine the valency of rare-earth ions in their monochalcogenides and to find the magnetically ordered states at low temperatures. The magnetic properties of Ce, Pr, and Nd monochalcogenides are studied over a wide temperature range. The magnetic measurements at elevated temperatures show that the 4f electrons of metal ions are localized and their number is equal to that of the free tripositive metal ions. At low tempera-

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACC NR: AP7001979

tures all the compounds investigated exhibit magnetic ordering except for PrSe and PrTe. The possible types of magnetic ordering, and a mechanism for the exchange interaction, are discussed. The authors wish to thank Y. P. Irchin for useful discussions. Orig. art. has: 2 tables and 3 figures. [Based on authors' abstract]

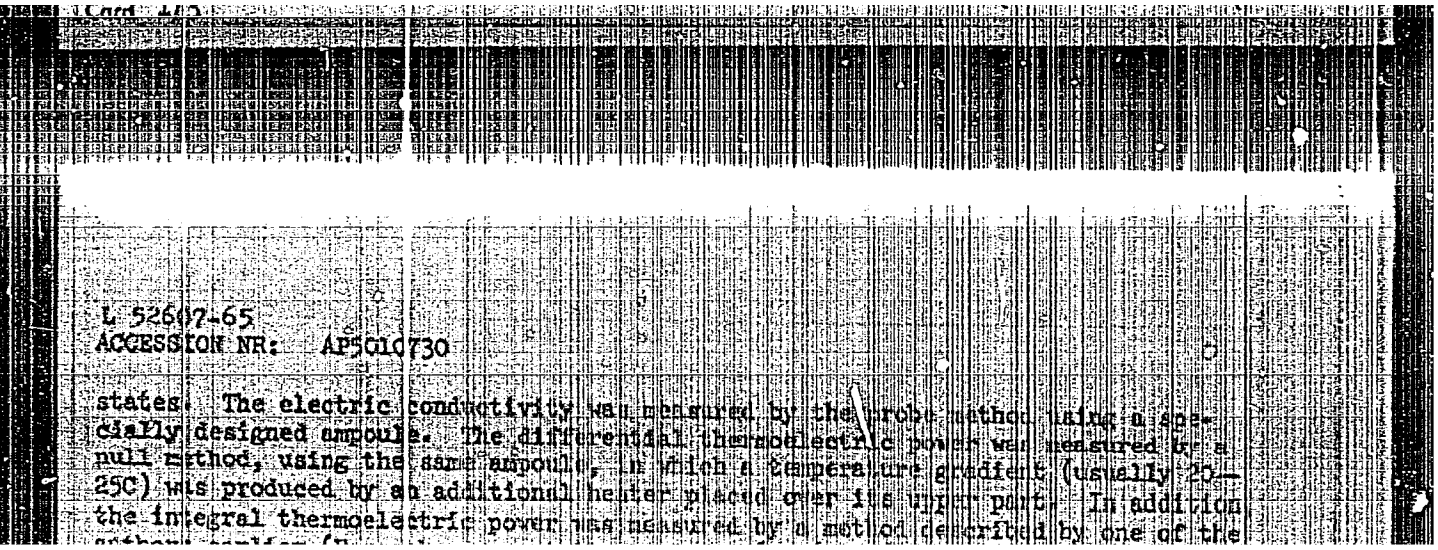
[DW]

SUB CODE: 20/SUBM DATE: 01Aug66/ORIG REF: 006/OTH REF: 013/

Card 2/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5



L 52607-65
ACCESSION NR: AP5010730

states. The electric conductivity was measured by the probe method using a specially designed ampoule. The differential thermoelectric power was measured by a null method, using the same ampoule, in which a temperature gradient (usually 20—25C) was produced by an additional heater placed over its upper part. In addition the integral thermoelectric power was measured by a method described by one of the

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

BOGOMOLOV, V.N.; ZHUZE, V.P.

Anisotropy of the Hall effect in partially reduced single-crystal rutile (TiO_2). Fiz. tver. tela 5 no.11:3285-3290 N '63. (MIRA 16:12)

1. Institut poluprovodnikov AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.; GOLUBKOV, A.V.; TONCHAROVA, Ye.V.; KOMAROVA, T.I.; SERGEYEVA, V.M.

Electric properties of samarium sulfide. Fiz. tver. tela 6 no.1: 268-27[illegible] Ja '64. (MIRA 17:2)

1. Institut poluprovodnikov AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ZHUZE, V.P.; GOLUBKOV, A.V.; GONCHAROVA, Ye.V.; SERGEYEVA, V.M.

Electric properties of monochalcogenides of rare-earth elements (cerium subgroup). Fiz. tver. tela 6 no.1:257-267 Ja 64. (MIRA 17:2)

1. Institut poluprovodnikov AN SSSR, Leningrad.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACCESSION NR: AP4011764 S/0181/64/006/001/0257/0267

AUTHORS: Zhuze, V. P.; Golubkov, A. V.; Goncharova, Ye. V.; Sergeyeva, V. M.

TITLE: Electrical properties of rare earth compounds (cerium subgroup) with members of the sulfur group

SOURCE: Fizika tverdogo tela, v. 6, no. 1, 1964, 257-267

TOPIC TAGS: electrical properties, rare earth, cerium subgroup, sulfur group, resistivity, thermal conductivity, thermoelectromotive force, LaS, CeS, PrS, NdS, LaSe, CeSe, PrSe, NdSe, LaTe, CeTe, PrTe, NdTe

ABSTRACT: The authors have synthesized the compounds LaS, CeS, PrS, NdS, LaSe, CeSe, PrSe, NdSe, LaTe, CeTe, PrTe, and NdTe. They determined the dependence of resistivity and thermoelectromotive force on temperature in the interval 300-1300K, and they measured the thermal conductivity at room temperature. The resistivity increases moderately but steadily with increase in temperature for each compound. The thermoelectromotive force declines with rise in temperature, as shown in Fig. 1 on the Enclosures. Many of the properties of the compounds are

Card 1/2

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"

"APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5

ACCESSION NR: AP4011764

summarized in Table 1 on the Enclosures. The results of measurements indicate that the investigated compounds have the nature of metallic conductors. "We take this opportunity to express our sincere thanks to our co-workers at the x-ray laboratory of IPAN, I. A. Zaslavskiy and T. B. Zhukova for x-ray analyses of the samples and also to the co-workers at cur laboratory, M. A. Demina dnd T. I. Komarova for aid in preparing the samples." Orig. art. has: 6 figures, 4 tables, and 6 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AN SSSR)

SUBMITTED: 30Jul63 DATE ACQ: 14Feb64 ENCL: 02

SUB CODE: PH NO REF SOV: 003 OTHER: 025

Card 2/4

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002065110001-5"